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THE SURGICAL TREATMENT OF INTRACTABLE PAIN

LOYAL DAVIS, M.D.
CHICAGO

The suffering associated with syphilitic visceral crises, inoperable carcinomas with metastases, angina pectoris, and trigeminal neuralgia needs only to be mentioned to emphasize that there are many unsolved problems associated with the physiology of pain and the surgical procedures employed for its relief. Certain clinical and experimental observations are of interest in an attempt to learn more of the pathways for the conduction of painful impulses and the methods employed for their surgical relief. In many instances, surgical empiricism has preceded known anatomic and physiologic facts in attempts to relieve the pain of some of these diseases.

Some years ago, Ranson and his associates [1] found in the cat that, as the posterior spinal roots enter the spinal cord, there is a sharp separation of the larger myelinated from the finest myelinated and unmyelinated fibers. The latter fibers, which constitute the lateral division of the root, are so placed that they may be divided easily by making a small incision along the posterior lateral sulcus of the spinal cord. They found that, immediately before such a lesion was made, stimulation of the posterior root caused struggling, a rise in blood pressure and rapid respirations. After section of this lateral division, without injuring the large medial division of the root, none of these responses existed. On the contrary, section of the large medial division of myelinated fibers produced no effect on these evidences of pain. Likewise, it was found that section of the lateral columns of the white matter of the cord prevented these somatic painful reflexes.

It became of interest to know whether or not painful impulses from the viscera traveled over the same pathways within the spinal cord. Consequently, vasomotor, respiratory and other evidences of pain in an animal were produced by faradic stimulation of the thoracic-sympathetic trunk.[2] Varying rates of stimulation of the distal end of the splanchnic nerves invariably produced painful responses in normal animals. Subsequently, various horizontal lesions were produced in the spinal cord in an effort to obliterate these responses. Sections of the posterior, anterior and lateral columns and lateral and posterior hemisections were produced without effect. It was found that a complete transverse section of the cord was the only experimental lesion that was followed by a cessation of these painful responses to stimulation. It was concluded that painful impulses from the viscera, transmitted by the thoracic-sympathetic trunk, are conducted upward by relays of short spinal paths with synapses in the gray matter of the spinal cord and do not pass into the lateral spinothalamic fiber tracts in the white matter, which serve to transmit somatic painful impulses.

An effort was then made to perform experiments which would more closely simulate visceral pain clinically. Dilation of the cystic and common ducts and of the ureters by balloons was undertaken. In the meantime, Schrager and Ivy,[3] working on the same problem from a different angle, showed that dilation of the cystic duct in the dog is accompanied by a marked inhibition of respiration, vomiting, struggling and other evidences of pain. They showed also that these responses could be abolished completely by section of the right splanchnic nerve and that they were unaffected by division of the vagi or left splanchnic nerves. In association with Hart and Crain,[4] these experiments were repeated, and, in addition, lesions of the spinal cord were produced in a manner similar to the earlier experiments. The results obtained were identical; that is, a complete transverse section of the spinal cord, or a lateral lesion which definitely injured the gray matter, was necessary to obliterate the responses to these painful impulses. The posterior spinal roots were sectioned in a series of these animals and it was found that, if a sufficiently large number were sectioned bilaterally, painful responses so produced could be abolished. Stone [5] has recently corroborated these experiments on dilation of the gallbladder after posterior root section. He has also conducted a series of similar experiments with dilation of the gallbladder after anterior root section. Contrary to the views expressed by Lehmann,[6] Shawe [7] and others that there is an antidromic fiber in the anterior roots which serves as a conduction pathway for visceral painful impulses, Stone has been unable to obliterate the normal responses from dilation of the gallbladder by section of the anterior roots.

Thus far, then, it may be suggested that visceral afferent impulses from the gallbladder, for example,

From the Department of Surgery, Northwestern University Medical School.

Read before the Section on Surgery, General and Abdominal, at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 16, 1933.

1. Ranson, S. W., and Billingsley, P. R.: Afferent Spinal Path for Depressor Reflex: Studies in Vasomotor Reflex Arcs, Am. J. Physiol. **40**: 571 (June) 1916. Ranson, S. W., and von Hess, V. L.: The Conduction Within the Spinal Cord of the Afferent Impulses Producing Pain and the Vasomotor Reflexes, ibid. **38**: 128, 1915.

2. Davis, Loyal: The Pathway for Visceral Afferent Impulses Within the Spinal Cord, Am. J. Physiol. **59**: 381, 1922.

3. Schrager, V. L., and Ivy, A. C.: Symptoms Produced by Distention of the Gallbladder and Biliary Ducts, Surg., Gynec. & Obst. **47**: 1 (July) 1928.

4. Davis, Loyal; Hart, J. T., and Crain, R. D.: The Pathway for Visceral Afferent Impulses Within the Spinal Cord, Surg., Gynec. & Obst. **49**: 647, 1929.

5. Stone, T. T.: The Rôle of the Anterior Roots in Visceral Sensibility, to be published.

6. Lehmann, W.: Ueber die sensiblen Fasern der Vorderwurzeln, Klin. Wchnschr. **3**: 1895, 1924.

7. Shawe, R. C.: The Gastric Crises of Tabes Dorsalis and Their Surgical Treatment, Brit. J. Surg. **9**: 450 (Jan.) 1922.

pass upward through the right splanchnic nerve, the thoracic sympathetic trunk, by way of the white rami to the spinal nerves, and then by way of the posterior roots into the cord. Within the cord these impulses pass upward by relays of short spinal paths with synapses in the gray matter.

These experimental facts have a definite and direct application in clinical surgery. For many years, surgeons have attempted to relieve the pain of the visceral crises in tabes dorsalis by posterior root sections or by

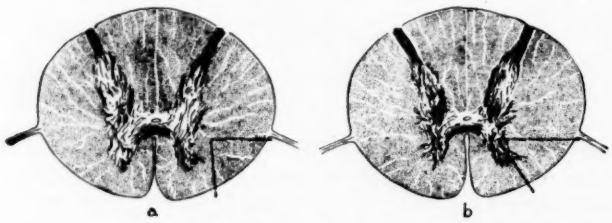

Fig. 1.—Thoracic segment of the spinal cord: *a*, direction of the incision anterior to the dentate ligament to include the anterolateral column for the relief of somatic pain; this incision must be carried medially (*b*) to include part of the gray matter in order to obtain relief from visceral pain.

anterolateral sections of the spinal cord, an operation which was first suggested by Spiller and carried out by Martin.[8] The results of chordotomy operations performed for the relief of such visceral pains uniformly have been unsuccessful if the sections have been made to affect only the spinothalamic tracts. Whereas such a procedure invariably relieves pain of somatic origin, visceral pain has been unrelieved. However, it has been noted that when such lesions have been carried deeply, so that a portion of the gray matter has been included, relief from tabetic visceral crises has been obtained (fig. 1). Recently Foerster,[9] in an autopsy specimen, demonstrated the level of a chordotomy that had been performed with success for the relief of gastric crises. His sections showed unmistakably the extent of the lesion in the gray matter of the cord. This is exactly what one would expect from the experimental facts.

The results of posterior root sections for the relief of visceral crises have not been uniformly successful. Probably the error has been in the failure to section a sufficient number of posterior roots bilaterally. A clinical experience with such a case is to the point:

The posterior roots from the fourth dorsal to the twelfth dorsal segment inclusive were sectioned bilaterally in a patient with severe visceral crises. This procedure was carried out in two operations and inadvertently the eighth pair of spinal roots were left intact. Although the area of superficial cutaneous sensibility represented by this root was extremely small, the patient continued to have pain until this root was sectioned. It would appear that only a very small pathway into the spinal cord was sufficient to carry the painful visceral impulses in this patient.

In support of the effect of adequate posterior root sections on the relief of pain of visceral origin, another clinical experience is in point:

A man had been suffering from angina pectoris for the past four years, during which time he had been wholly unable to work. He had been under observation in the cardiac clinic and was taking large doses of glyceryl trinitrate daily for the relief of his pain, which occurred while at rest and on the slightest exertion. His pain began over the sternum and spread along the ulnar sides of both arms, but more particularly into the left, in which the pain was felt in his ring and fifth fingers. A laminectomy was performed, and the posterior roots of the first six thoracic segments were sectioned bilaterally. His relief from pain has been complete for one year following the operation without the slightest impairment of function in his upper extremities (fig. 2).

As far as I am aware, this is the first recorded instance of the relief of angina pectoris by posterior root section. Such a surgical procedure for the relief of angina pectoris is based on a knowledge of the pathway of the visceral afferent impulses into the spinal cord. It should be recognized also that the cardiac accelerator mechanism is not disturbed by such an operation.

This leads to the mechanism of the reference and recognition of pain from visceral disease in the periphery. A number of theories exist for the explanation of the sensation evoked by visceral stimulation. Lennander's[10] idea that all visceral pain was mediated through the parietal peritoneum was disproved by Neumann.[11] Ross[12] has stated that either true visceral pain may be present alone or it may occur in association with pain in the skin, muscles and connective tissue innervated by the same spinal segments. Lange[13] thought all pain in visceral disease was purely reflex in origin. He traced the impulses through the afferent fibers of the vegetative nervous system to the spinal

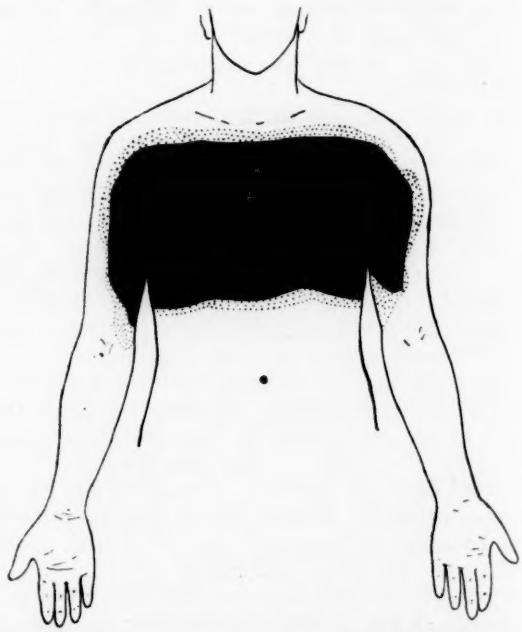

Fig. 2.—Sensory loss after bilateral section of the posterior roots of the first six thoracic segments for the relief of angina pectoris.

cord, where he believed that radiation occurred along the sensory tracts to the abdominal wall. Spiegel[14] states that the impulses pass to the posterior horns of the spinal cord and are there diffused to the roots of the corresponding somatic nerves. Mackenzie,[15] Ross[12]

8. Spiller, W. G., and Martin, Edward: The Treatment of Persistent Pain of Organic Origin in the Lower Part of the Body by Division of the Anterolateral Column of the Spinal Cord, J. A. M. A. **58**: 1489 (May 18) 1912.
9. Foerster, O.: Lecture read before the Chicago Institute of Medicine.
10. Lennander, K. G.: Ueber die Sensibilität der Bauchhöhle und über lokale und allgemeine Anaesthesie bei Bruch- und Bauchoperationen, Centralbl. f. Chir. **28**: 209, 1901.
11. Neumann, A.: Zur Frage der Sensibilität der innern Organe, Centralbl. f. Physiol. **24**: 1213, 1910-1911.
12. Ross, J.: On the Segmental Distribution of Sensory Disorders, Brain **10**: 333, 1888.
13. Lange, C.: Nogle bemäikninger am Neuralgier of deres behandlung, Hospitalstid **2**: 641, 1875.
14. Spiegel, E.: Ueber das Wesen des Bauchschmerzes und seiner Begleiterscheinungen, Wien. med. Wchnschr. **77**: 379, 1927.
15. Mackenzie, James: Symptoms and Their Interpretation, London, Shaw & Sons, 1920.

and Head [16] all believe that in visceral disease a form of irritation is produced in the spinal cord and that sensory impulses from other parts passing into this segment are so exaggerated as to be painful.

In corroboration of the work of Weiss and Davis [17] and of Lemaire,[18] we have been able to relieve the pain of gallbladder colic, angina pectoris and other intra-abdominal lesions by the subcutaneous infiltration of procaine hydrochloride solution in the peripheral area to which the pain is referred. In experimental support of these clinical observations, we [19] have shown that the evidences of pain produced in an animal by dilation of the cystic duct are definitely altered by section of the intercostal nerves. The relief of the pain of angina pectoris by paravertebral injections of alcohol is corroborative of these facts. I suggest, however, that this relief is obtained by the effect of the alcohol on the intercostal peripheral nerves and not solely on the injection of the sympathetic rami communicantes. The anatomic relations of these structures make isolated injections of the rami communicantes almost impossible, and the presence of peripheral cutaneous sensory changes make this supposition highly probable. It is possible that visceral painful impulses produce efferent cutaneous reflex effects, which in turn liberate a metabolite in the skin which is painful. These somatic painful impulses are in turn carried into the cord and to consciousness over the well known somatic afferent pathways. This conception of the mechanism of referred pain from the viscera was set forth by Pollock and me [20] as the result of a series of experiments on stimulation of the cervical sympathetic chain before we were aware of Lemaire's work and his similar theory.

Recently, the rôle of the sympathetic nervous system in the production of pain has been under investigation. The results of some of these experiments have led some authors to doubt the validity of the Bell-Magendie law, which attributed motor functions alone to the anterior spinal roots. Special emphasis on the importance of this aspect of the sympathetic system has been made by the reports of the relief of other types of pain, such as angina pectoris, causalgia and abdominal pains, by various surgical operations on the sympathetic nervous system. Jonnesco [21] has relieved the pain of angina pectoris by the removal of the middle, inferior cervical and first thoracic ganglions of the left sympathetic chain. Successful results have been reported from essentially similar operations by Brüning [22] and others. Coffey and Brown [23] have obtained somewhat similar results by sectioning the sympathetic trunk and the superior cardiac nerve below the superior cervical ganglion or by excising this ganglion. Foerster, Altenburger and Kroll [24] reported some observations on man in which pain was produced by suitable stimuli in areas in which the somatic afferent supply had been severed. They believed that the only possible intact afferent pathway consisted of periarterial plexuses of nerve fibers which ended in the sympathetic ganglionic chain. From these observations, they concluded that sensory impulses may travel along periarterial plexuses to the sympathetic ganglionic chain and from there enter the spinal cord. On the basis of the work of Mandl [25] on paravertebral injections, attempts have been made to block the rami communicantes by such a method.[26] Abdominal pains have likewise been relieved by von Gaza,[27] Scrimger [28] and Archibald [29] by section of the abdominal sympathetic nerves, and the sacral portion of the sympathetic trunk has been resected for the relief of pain in inoperable carcinoma of the uterus.

Although pain may be produced by stimulation of parts of the sympathetic nervous system or relieved by severance of suitable parts of the sympathetic nervous system, there is no agreement as to the physiologic mechanism involved. Painful impulses may be conducted along the sympathetic nerve fibers, or the viscero-motor or other reflex activities may produce conditions which in turn are responsible for conscious pain. On the other hand, both mechanisms may be present.

Pain has been produced by faradic stimulation of the superior cervical sympathetic ganglion in man by Frazier,[30] Peet [31] and Foerster.[32] The head is a particularly suitable part of the body for the investigation of the rôle of the sympathetic nervous system in the production of pain, because it is possible to cut all the posterior roots connected with the cervical sympathetic chain without producing an analgesia of the skin overlying the parts from which painful sensation may occur. Since it is conceivable that the superior cervical ganglion and its immediate environs are supplied with sensation by nervi nervorum, it is necessary to clear this area of afferent nerves when one wishes to study the results of faradic simulation of the ganglion.

Langley [33] presented evidence to show that there are no afferent fibers in the cervical sympathetic trunk; this has been strengthened by the work of Ranson and Billingsley.[34] On an anatomic basis, the sympathetic supply to the structures of the head and face must be considered as consisting purely of efferent fibers.

In a series of experiments to determine the rôle of the sympathetic fibers in the production of pain in

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34. Ranson, S. W., and Billingsley, P. R.: Branches of the Ganglion Cervicale Superius, J. Comp. Neurol. **29**: 367, 1918.

the face, Pollock and I[20] found that (1) stimulation of the cervical sympathetic trunk does not produce pain, and (2) that stimulation of the superior cervical sympathetic ganglion produces pain. The latter fact holds true after section of a large number of anterior and posterior spinal roots, beginning with the first cervical segment. It is also true after section of the anterior spinal roots and section of the sensory root of the trigeminal nerve. Pain could not be produced, however, by stimulation of the isolated ganglion after section of the posterior spinal roots and the sensory root of the trigeminal nerve. It is probable, therefore, that stimulation of the superior cervical sympathetic ganglion produces an effect which is carried by way of postganglionic efferent fibers to the structures innervated by the sympathetic fibers. These efferent impulses produce an effect on the skin and other structures the exact nature of which is as yet unknown. It is quite possible that this effect is linked with the sympathetic innervation of the blood vessels and that a metabolite is liberated which in turn stimulates the ordinary sensory nerve endings of the fifth nerve. This impulse is then transmitted centrally and is recognized as pain. The relief of pain of visceral disease by blocking or severing the intercostal and abdominal nerves, which has been previously mentioned, is in direct relation to these observations.

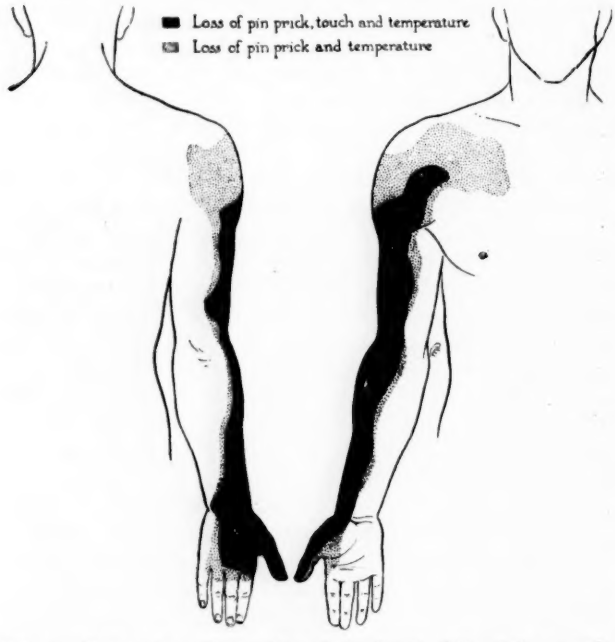

Fig. 3.—Sensory loss after section of the fourth, fifth, sixth, seventh and eighth cervical posterior roots.

Finally, the peripheral pathway for painful sensations must be considered. In other words, may pain be conducted antidromically over the anterior spinal roots into the spinal cord? This theory, in contradiction of the Bell-Magendie law, has been invoked to explain the failure of posterior root sections to relieve somatic pain.[35] Such a conception, if correct, would have considerable bearing on the surgical relief of pain. Without reciting the details of the clinical cases reported in the literature, the assumption of the existence of antidromic sensory fibers in the anterior roots was based on the observations (1) that all sensation did not disappear from an expected area following section of the posterior roots; (2) that pain was not relieved or returned after section of the posterior roots, and (3) that pain did disappear permanently after section of the anterior and posterior roots.

A clinical experience may be cited in which there was a complete loss of all sensibility after section of all the posterior roots to an upper extremity in a man:[36]

A young man suffering from the sequelae of epidemic encephalitis in the form of a parkinsonian state applied for help. The rigidity was so great as to make life unbearable. Despite the administration of large and sustained doses of scopolamine, he was often unable to assist himself in the simplest wants. It was thought justifiable to section the posterior roots which supplied the right upper extremity, which was the more rigid, in the hope that, if the rigidity disappeared, subsequent muscle reeducation would make the limb serviceable.

Dec. 14, 1928, under local anesthesia, a laminectomy was performed, on the third, fourth, fifth and sixth cervical vertebrae. The fourth, fifth, six, seventh and eighth cervical posterior roots on the right side were ligated and sectioned. The sensory loss occupied chiefly the areas ordinarily attributed to the fifth, sixth and part of the seventh cervical segments (fig. 3). Therefore, Jan. 9, 1929, again under local anesthesia, a laminectomy was performed on the seventh cervical and on the first, second and third dorsal vertebrae. The first, second, third and fourth right dorsal posterior roots were sectioned. Sensory examination at this time showed complete loss of pain, touch and temperature sense over the entire right upper extremity and the upper part of the thoracic wall extending downward to the nipple line. The area of loss of touch slightly exceeded this border, and the loss of cold was slightly more extensive than the loss of touch. Passive movement of the segments about the joints of the fingers, wrist and elbow were not recognized. Vibration sense was absent over the elbow, wrist, fingers and thumb, and he was unable to describe the position passively imposed on the extremity. Deep pin prick and piercing the skin were not felt on the forearm, lower part of the arm, wrist or fingers. Pinching with artery forceps did not produce pain, and piercing the median basilic vein, scratching its intima and lacerating it produced no pain. No sensation was experienced on the prolonged application of the distended cuff of a sphygmomanometer, and its release was not accompanied by any sensation. Compressing a segment of a vein and distending it with physiologic solution of sodium chloride produced no pain. Piercing the radial artery, distending a segment of it with saline solution and lacerating it produced no sensation. The upper border of the loss of deep sensation and pressure pain was not outlined at this time.

April 7, 1930, the patient was reexamined. The upper level of pressure sensation was bounded by a line 1½ inches below the area of loss of touch. The loss of deep pressure pain sense, with a 6 Kg. stimulus, was bounded by a line about 2 inches below the area of loss of touch. It is of interest that deep pressure pain could not be elicited over the upper part of the chest, because the supply to the pectoral, serratus magnus and latissimus dorsi muscles had been interrupted. The most severe twisting and pinching of the skin was not felt, and transfixing the skin with a hypodermic needle did not evoke any sensation. About 1 cc. of a solution of neoarsphenamine was injected about the median cephalic vein and, although inflammatory changes were produced, no sensation was felt. The radial artery was transfixed by a needle electrode, and no sensation was felt on stimulation by a strong faradic current.

These observations have been corroborated by experimental investigations of the reflexes on animals before and after decerebration. The insensitive extremity participated in the rigidity assumed by the other legs. It reacted normally to tonic neck and labyrinthine reflexes.

35. Kidd, Leonard: Afferent Sensory Fibers in the Spinal Ventral Roots, Brit. M. J. **2**: 359, 1911. Lehmann.[6] Shawe.[7] Wartenberg, R.: Klinischen Studien zur Frage der Geltung des Bell-Magendieschen Gesetzes, Ztschr. f. d. ges. Neurol. u. Psychiat. **113**: 518, 1928.

36. Davis, Loyal, and Pollock, L. J.: The Peripheral Pathway for Painful Sensations, Arch. Neurol. & Psychiat. **24**: 883 (Nov.) 1930.

Crossed extension was produced in it by flexor responses to painful stimuli applied to the opposite upper extremity. Not a single reflex movement on the same or opposite side could be elicited by any form of stimulation of the affected extremity. Pricking the skin, pushing against the foot pad, incising the skin or aponeurosis, fascia, muscle or nerves, stimulating the vessels and nerves with a faradic current, scraping the periosteum and crushing the bones all failed to produce the slightest motor response. I believe it is justifiable to assume that, if all of the posterior roots to an extremity are sectioned, all sensation, cutaneous and deep, will be lost.

SUMMARY

1. Visceral afferent painful impulses travel by way of the splanchnic nerves to the spinal cord and thence upward by relays of short neurones in the gray matter.

2. Chordotomy, unless the lesion is deep and injures the gray matter, will not relieve visceral pain, although it will abolish intractable somatic pain.

3. Posterior root section operations, in which a sufficiently large number of roots are severed, will abolish visceral pain.

4. The pain of angina pectoris has been abolished by posterior root section. Such an operation definitely attacks the afferent pathway for the painful impulses and does not interfere with the cardiac accelerator mechanism.

5. The stimulation of efferent sympathetic fibers produces changes in the periphery, which in turn stimulate the ordinary somatic afferent fibers that transmit pain. The relief of pain by section of sympathetic fibers is, therefore, based on the interruption of efferent pathways.

6. Section of all the posterior roots that supply the upper extremity in man and in animals interrupts all form of superficial or deep sensation.

7. There is no evidence of a sensory pathway through the anterior spinal roots.

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ABSTRACT OF DISCUSSION

DR. MAX M. PEET, Ann Arbor, Mich.: A good deal of confusion has arisen as to what is meant by sympathetic fibers and as to whether they carry pain or are purely efferent or afferent. The anatomists Ransom and Hubert probably take the best view. They state that surgeons are confusing the matter when they speak of surgery of the sympathetic system instead of surgery of the autonomic system. According to them, the sympathetic system is a gross anatomic term connoting a gross group of nerves and ganglions which are of mixed nature; they contain efferent autonomic fibers and posterior root sensory fibers. When as surgeons we speak of stopping pain by a sympathectomy, do we mean that we are cutting posterior root fibers or that we are interrupting efferent fibers, carrying impulses out from the cord? Are we stopping pain because we are stopping it or are we stopping its recognition? I have felt that the autonomic system may cause pain by causing peripheral contracture of the blood vessels or by some other unknown mechanism, and that when we cut the gross anatomic structure spoken of as a sympathetic chain we may be doing one of two things, either cutting autonomic fibers that are carrying out impulses or cutting sensory fibers returning that sensation, in which case we are interrupting the recognition of the original stimulus. The question has been raised by Davis and others: Do the anterior roots carry pain sensation or anything that may cause pain sensation? I have had only one indication in a series that pain fibers may be carried in the anterior root. This was in an elderly woman who had typical intercostal neuralgia in every way resembling that of trigeminal neuralgia except in its anatomic distribution. It is the only case that I have seen that I would want to call intercostal neuralgia. She had every manifestation of a tic douloureux except it was in her back. The pain was completely eliminated and no longer would any stimulus bring on pain, but at times she had pain develop without outside stimuli. Some time later I exposed the spinal cord again, and when I touched one of the anterior roots she had excruciating pain which she described as identical with the pain she had been having, and when I cut them she was free. I am convinced from a series of a little over eighty chordotomies that chordotomy performed at a deep enough level and sufficiently high in the spinal cord will relieve both somatic and visceral pain. I feel that the visceral pain enters at many levels, that it is carried up along that gross sympathetic tract and that one must go very deep into the gray matter, as Davis has shown, in order to stop the pain of visceral origin.

DR. JOHN L. GARVEY, Milwaukee: Dr. Davis has presented some very conclusive clinical experiments. It is very difficult to go into the subject of the sensation of pain in animal experimentation. I think it has been carried through in a clinical way by the neurosurgeons in a fine manner and that they have added a great deal to the knowledge of neural physiology.

THE POSTPARTUM KIDNEY

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AND
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NEW ORLEANS

Renal infections complicating pregnancy are receiving an ever increasing degree of attention from both obstetricians and urologists. This unquestionably bespeaks a further reduction in the untoward situations arising out of the parturient state. Until recently, the major portion of care was devoted to the antepartum period, to the neglect of many postpartum sequelae. It can no longer be taken for granted that, following delivery, vigilance can be relaxed. Hospital records attest the fact that postpartum complications still occur and, in fair measure, the urinary tract shares in these unfortunate end results.

Because such cases have come under our observation, in private practice, it was considered that a report might be of interest. We include cases that were unrecognized prior to delivery, cases recognized before delivery but remaining untreated until after parturition, and cases recognized but presenting no complications until after childbirth.

The delay in detecting many of these conditions we believe due to the patient's feeling that such symptoms are a part of the discomfort pregnant women must endure, while others purposely conceal their distress in fear that complaint will render them subject to additional suffering by having to undergo instrumental investigation. It would appear, therefore, that the physician must encourage more assiduous urine studies and offer assurance that today cystoscopy can be performed painlessly.

Before entering into a discussion of the group of cases to be considered, it might be well to review, briefly, the theories that have been advanced regarding renal infection during pregnancy. Owing to the fact that about 80 per cent of all pregnant women have stasis of the upper urinary tract, no matter how normal their course, it is not easy to explain why some 90 per cent of them terminate labor without renal complications.

Read before the Section on Urology at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 16, 1933.

Since Folsom [1] presented his work on the compound racemose glands of the female urethra, there has been a clearer understanding of many postpartum infections. His studies point to a possible lymphatic extension from the deep urethra in women to the kidney pelvis. During delivery, infected urethral glands are frequently traumatized. A resulting lymphangitis, in the presence of pelvic stasis, could readily serve as a nidus for bacterial growth. Escherichia coli is the micro-organism most commonly observed in these patients and the staphylococcus group comes next in frequency.

Cases of Postpartum Renal Infection

Case	Urine Sediment		Renal Pelvis Stasis				Temperature Before Treatment	Renal Lavage	Indwelling Catheter	Number of Lavages Required	Time Required to Bring Temperature to Normal
			Before Treatment		After Treatment						
	Before Treatment	After Treatment	Right	Left	Right	Left					
1	Pus 4 Coli 4	Pus 1 Coli 1	15 cc.	None	None	None	104.2	Yes	None	1	12 hours
2	Pus 4 Coli 4	Pus 4 Coli 4	25 cc.	15 cc.	20 cc.	15 cc.	103.8	None	2 day intervals; 3 sittings	3	Temperature dropped; recurrent rise; died of sepsis
3	Pus 4 Coli 4	No follow up	None	None	None	None	104.0	Yes	None	1	1 day
4	Pus 1 Staph. 1	Pus 1 Staph. 1	None	None	None	None	103.8	Yes	None	1	1 day
5	Pus 4 Coli 4	Pus 3 Coli 2	12 cc.	None	5 cc.	None	104.0	Yes	24 hrs.	2	3 days
6	Pus 4 Coli 4	Normal Normal	None	None	None	None	104.2	Yes	None	1	1 day
7	Pus 2 Coli 2	Pus, few cells Coli 2	None	None	None	None	105.0	Yes	None	1	2 days
8	Pus 4 Coli 4	Normal Normal	30 cc.	15 cc.	None	None	103.0	Yes	18 hrs.	3	3 days
9	Pus 4 Coli 4	No pus Coli 2	None	None	None	None	105.3	Yes	None	3	10 days
10	Pus 1 Coli 1	Normal	None	15 cc.	None	None	103.8	Yes	None	2	2 days
11	Pus 4 Coli 4	Normal	None	None	None	None	.....	Yes	None	3	10 days
12	Albumin 4	Albumin 1	40 cc.	20 cc.	None	None	102.0	Yes	None	2	3 days
13	Pus 4 Coli 4	Normal	None	None	None	None	104.0	Yes	None	5	18 days
14	Pus 4 Coli 4	Normal	10 cc.	None	None	None	105.0	Yes	R side 24 hrs.	3	11 days
15	Pus 4 Coli 4	Normal	12 cc.	10 cc.	None	None	105.0	Yes	R and L 12 hrs.	2	3 days
16	Pus 4	Normal	20 cc.	None	None	None	106.0	Yes	R and L 24 hrs.	4	10 days
17	Pus 1 Coli 4	Normal	None	None	None	None	104.0	Yes	None	4	17 days
18	Pus 2 Coli 2	Pus 1 Coli 1	10 cc.	12 cc.	None	None	105.6	Yes	R and L 2 days	3	8 days
19	Pus 4 Coli 4	Pus 1 Coli 1	None	None	None	None	104.2	Yes	None	2	5 days
20	Pus 4	Pus 1	20 cc.	None	5 cc.	None	104.0	Yes	R 24 hrs.	2	3 days
21	Pus 4 Coli 4	None None	80 cc.	10 cc.	None	None	102.0	None	R and L 24 hrs.	3	Died of sepsis
22	Pus 3 Coli 3	Normal	None	18 cc.	None	None	104.0	Yes	None	2	3 days
23	Pus 2 Coli 2	Pus 1 None	None	None	None	None	103.0	Yes	None	1	2 days
24	Pus 4 Coli 4	Pus 1 Coli 1	None	None	None	None	103.2	Yes	None	2	6 days
25	Pus 2 Coli 2	None	15 cc.	None	None	None	105.0	Yes	None	2	1 day
26	Pus 4 Coli 4	Pus 1 Coli 1	15 cc.	10 cc.	5 cc.	None	104.0	Yes	R and L 24 hrs.	3	7 days
27	Pus 4 Coli 4	Pus 1 Coli 1	None	85 cc.	None	10 cc.	100.0	Yes	L side 24 hrs.	3	1 day
28	Pus 4 Staph. 4	Pus 1 Staph. 1	10 cc.	None	None	None	100.8	Yes	None	2	2 days
29	Pus 2 Coli 4	Normal	None	10 cc.	None	None	106.0	Yes	None	3	8 days
30	Pus 4 Staph. 4	Pus 1 Staph. 1	80 cc.	60 cc.	10 cc.	5 cc.	101.0	Yes	R and L 24 hrs.	4	2 days
31	Pus 2 Coli 2	Pus cells, few Coli, few	20 cc.	None	None	None	103.0	Yes	None	2	1 day
32	Pus 4 Coli 4	Pus 4 Coli 4	——No cystoscopy permitted——				104.0	None	None	..	18 days
33	Pus 1	Normal	10 cc.	None	None	None	103.0	Yes	None	2	1 day
34	Pus 4 Coli 4	Normal	25 cc.	None	5 cc.	None	105.0	None	Dilated right ureter and drained right kidney 12 hrs.	2	1 day
35	Pus 4 Coli 4	Normal	None	10 cc.	None	None	104.2	Yes	L side 24 hrs.	2	3 days
36	Pus 4 Coli 4	Normal	48 cc.	None	10 cc.	None	103.6	Yes	R side 24 hrs.	3	2 days

Many ascending infections from the bladder, according to Hofbauer,[2] originate from urinary retention in

1. Folsom, A. I.: The Female Urethra, J. A. M. A. **97**: 1345-1350 (Nov. 7) 1931.

2. Hofbauer, J. I.: Personal communication to the authors.

atonic bladders due to traumatism that viscus sustains during labor. Prather [3] observed vesical residual urine in 1.1 per cent of pregnant cases. He feels that trauma, bladder complications and a flare up of previous infections of the urinary tract mainly explain such complications. Of the postpartum urinary disturbances studied by him, 87.6 per cent occurred in primiparas. This coincides with the figures in our series.

In our opinion, extension from the cervix, as an aftermath of the trauma to which this structure is subjected at delivery, has not been accorded sufficient attention. Aversion on the part of obstetricians to study, microscopically, stained smears of secretion obtained from cervices immediately after delivery (an attitude eminently sound) makes it most difficult to state with exactness the proportion of cases falling in this category. However, when it is realized that fully 75 per cent of parturient women have endocervicitis, in varying degree, and when studies of Benedict, Von Lackum and Nickel [4] are recalled, which stress the interrelation between inflammatory diseases of the eye and foci in pelvic organs, it is rational to suppose that the cervix plays a part in the creation of the postpartum kidney.

Hunner [5] directed attention to the possibility of ureteral stricture as a causative factor in the production of renal infection. We would have been unsuccessful in clearing up at least one of our cases had we ignored his teachings.

Whether the extension is lymphogenous more often than hematogenous is beside the question. Blood stream infections are observed by all urologists, and beyond any doubt some postpartum kidney lesions are to be attributed to this factor. It has become an axiom among cystoscopists that pyelonephritis following delivery and puerperal fever are not infrequently synonymous.

Crabtree and Prather [6] stress the importance of hospitalization of these cases and prove, by their results, the value of a urologic consultant on the staff of every institution having a lying-in department. They emphasize conservative treatment in kidney ailments during pregnancy, such as forced fluids, rest in bed, urinary antiseptics and sedatives as needed. This plan is to be strongly recommended. When, after a fair trial, it fails to relieve, more energetic means must be employed. The series of cases here reported fall into the latter group.

We reiterate our position relative to internal urinary antiseptics. For the past seven years we have devoted a great deal of attention to this fascinating and controversial problem. Our work has been divided equally between studies in the urologic wards and experimental investigations in the pharmacologic laboratory. All the drugs presently recommended for use in urinary infections have been submitted to extensive and impartial trial. Our conclusions remain in accord with the observations [7] that, of all urinary antiseptics now in use, pyridium in doses of from 0.1 to 0.2 Gm., administered orally three times a day, is superior to other drugs. These conclusions are based on having administered the dye in some 3,000 cases over a period of time sufficiently adequate to judge of its merit. Not alone does pyridium retard bacterial growth in the majority of cases but it invariably has a soothing effect on the bladder mucosa not experienced in other drugs.

In the past seven years, 610 cases of pyelonephritis have been treated at the Southern Baptist Hospital; this, from a total of 42,000 admissions, gives an incidence of 1.4 per cent. Of this number of kidney infections, fifty-eight, or 2.4 per cent, occurred among the 2,400 women admitted for delivery. Postpartum kidney infection was observed in thirty-six, or 1.5 per cent. It is with the latter group that we are concerned. It should be remembered that in this postpartum series we were called in consultation because most of the patients were quite ill. Conservative measures had been tried by the attending obstetricians, in nearly every instance, without relief of symptoms. Of the thirty-six cases of postpartum renal infection tabulated, twenty-one patients, or 58.3 per cent, had temperatures of 104 or above when first seen. Twenty-four patients, or 66⅔ per cent, had pelvic stasis; eleven, or 30.5 per cent, in the right side; five, or 13.8 per cent, in the left, and eight, or 22.2 per cent, in both sides. This stasis varied from 10 to 85 cc. Seven, or 19.4 per cent, left the hospital with from 5 to 20 cc. of stasis; twenty-seven, or 75 per cent, were dismissed with no stasis. All but three cases showed marked pyuria and bacteriuria or both. Twenty-eight, or 77.7 per cent, showed Escherichia coli, while only three, or 8.3 per cent, showed staphylococci. Seventeen patients, or 47.1 per cent, left the hospital with some evidences of infection still present; these were out-of-town patients and could not be followed to the point of renal sterilization. Seventeen patients, or 47.1 per cent, were discharged with normal urines. One case disappeared early from observation, and in the other cystoscopy was refused.

All these patients were confined to bed in the hospital, as the symptoms were recognized within a few days following delivery. Attempting to keep the lower colon empty with high flushes is routine with us in dealing with infected kidney cases. Seven days on restricted fluids plus pyridium by mouth is alternated with three days of forced fluids plus alkalis. When difficulty is experienced in getting the patient to swallow sufficient water (from six to ten glasses daily), fluids are administered by means of the duodenal tube, by proctoclysis, by hypodermoclysis or by the intravenous Matas drip (physiologic solution of sodium chloride or dextrose being used).

Two types of local treatment were employed to combat the pyrexia and lumbar pain. In thirty-two, or 88.8 per cent, lavage with 0.5 per cent silver nitrate solution through a 7 F. ureteral catheter was instilled after the stagnant urine had been aspirated from the pelvis of the kidney. From one to five such treatments at intervals of four days proved most effective. Fourteen, or 41.6 per cent, of the cases were treated with indwelling catheters, usually of sizes from 7 to 9 F., the time allowed for the catheter to remain in place ranging from eighteen hours to two days, the time factor being determined by the amount of stasis and the tolerance of the individual. In thirteen patients, or 36.1 per cent, subjected to indwelling catheter drainage, including some of our most refractory cases, this procedure aided materially in shortening the convalescence. By one or the other of these methods, or by combining the two, the temperature was reduced to normal in from one to eighteen days. The average time required to relieve patients from fever was five

3. Prather, G. C.: Postpartum Bladder Complications, Am. J. Obst. & Gynec. **17**: 215-226 (Feb.) 1929.
4. Benedict, W. L.; Von Lackum, W. H., and Nickel, A. A. C.: The Pelvic Organs as Foci of Infection in Inflammatory Diseases of the Eye, Arch. Ophth. **56**: 116-123 (March) 1927.
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days. The patient who refused cystoscopic therapy had a continuous high fever for eighteen days; it then dropped to normal, but the urine, at the time of discharge from the hospital, still showed pus 4 and Escherichia coli 4.

The two fatalities in the series resulted from general sepsis. Whole blood transfusions, by the method of Head, have proved most valuable to us in treating septicemia. However, both of these patients came under observation too late for this procedure to be of assistance.

An analysis of this series reaffirms our previous contention that indwelling ureteral catheters, when used judiciously, cause no ill effects and, in many instances, unquestionably shortened the period of treatment. By adopting catheters coated with gold leaf, introduced by one of us,[8] the hazards of having urinary salts attack the gum coating on ordinary catheters is obviated, thereby doing away with the possibility of traumatizing the ureteral mucosa on withdrawal.

During the past year we have been experimenting with soft rubber ureteral catheters, made rigid for introduction by whalebone stylets, and favor them for indwelling purposes when it is found possible to introduce them. Certainly they cause less discomfort than the gum-silk ureteral catheters. Regarding lavage of the renal pelvis with antiseptic solutions, no argument is required to extol further its established place in the treatment of pyelonephritis.

628 Common Street.

URINARY TRACT INFECTIONS ASSOCIATED WITH PREGNANCY

THEIR FATE IN SUCCEEDING PREGNANCIES

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AND

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This study is based on a group of more than 400 cases of disease of the urinary tract associated with pregnancy, which have been treated by one or both of us over a period of years, extending from 1919 to the present time. Many of these patients were seen in but a single pregnancy; others have been regular customers at our clinic, and we have been able to compile data covering the complete child-bearing period in a considerable group. Unfortunately, owing to various handicaps that existed in former years, the earlier observations are less complete than those made in later years. Careful selections have been made from these cases, and we have used only proved facts, suffering the necessary shrinkage in numbers in the interest of greater accuracy.

A conception of the importance of urinary tract infection in relation to the whole child-bearing period in women is obviously of more importance than observations of one or two isolated pregnancies from the series.

From such an opportunity as had been provided for us between the years 1919 and 1933 to collect material along these lines we now endeavor to provide answers for the following questions:

1. What types of infection (exclusive of tuberculosis) are associated with pregnancy?
2. Does preexisting infection predispose to pyelitis in pregnancy?
3. What is the probability of cure of preexisting infections during pregnancy?
4. If infections from preceding pregnancies persist uncured into pregnancy, what is the chance of cure in pregnancy?
5. If infection has cleared between pregnancies, is the cure a guaranty of immunity from infection in subsequent pregnancies?
6. What is the relation of infected pregnancies in a series of pregnancies?
7. What influence does the type of infection have on the type of recurrence in a series of pregnancies?
8. What is the relation of gross pathologic changes of the kidney to infections in pregnancy?

TYPES OF INFECTION (EXCLUSIVE OF TUBERCULOSIS)

1. The bacillary infections: pyelitic type; pyelonephritic type. (*a*) Those cases which either after delivery or cystoscopic treatment show sudden subsidence of symptoms (pyelitic type). (*b*) Those which under the same conditions subside slowly over a period of days (pyelonephritic type).
2. The coccal infections which behave similarly to the bacillary infections except that there have been noted a few instances of profound sepsis due to various staphylococci and streptococci.
3. Cortical infections due to staphylococci (small abscesses).
4. Carbuncle of the kidney due to staphylococci.

In relation to the stage of the pregnancy, a second classification should be made:

1. Preexisting infection (before marriage).
2. Pyelitis in pregnancy.
3. Postpartum pyelitis.
4. Postpartum cystitis (catheter and constant drainage cases).
5. Intercurrent infection.

Two of the latter classification deserve some comment because they are not usually included in recognized classifications.

The first of these is cystitis. Since the year 1927 it has been our custom to use constant drainage in many of these cases of atonic bladders that follow delivery. These cases and certain of the intermittent catheterization cases show a pure cystitis.

There have also been recorded instances of infections that have occurred between pregnancies, often remote from the preceding pregnancies (in one instance eleven years before the pregnancy with which an infection occurred), which are clearly not to be looked on as persistent infections from preceding pregnancies.

The cases so recorded are:

Intercurrent infection between the second and third pregnancies. The third pregnancy was uninfected but there was a pyelitis with the fourth.

Diagnosis of a strictured ureter with infected urine was made between pregnancies which were widely separated. The stricture was treated, but the infection was not cured. Pyelitis occurred with the succeeding pregnancy.

After a normal third pregnancy with no urinary complications a pyelitis developed seven months after delivery. Pyelitis occurred with the succeeding pregnancy (fourth).

Intercurrent infection after the fourth pregnancy, no infection with fifth, sixth, seventh and eighth, but pyelitis with the ninth.

8. Walther, H. W. E.: Gold Leaf Coated Ureteral Catheters, J. Urol. **23**: 287-288 (Feb.) 1930.

From the Urological Clinic of the Boston Lying-In Hospital.

Read before the Section on Urology at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 16, 1933.

Intercurrent infection between the sixth and seventh pregnancies which was not cured. A mild pyelitis occurred with the seventh.

These cases seem to be on a par with other preexisting infections. They tend to recur when not cured before the beginning of the next pregnancy. If cured, the succeeding pregnancy may remain free from infection.

PREEXISTING INFECTIONS

These data are limited to patients in their first pregnancy in order to eliminate the possible effects of pregnancy on the urinary tract. Thirty-three cases were found in which the patients appeared in the clinic well advanced in pregnancy, giving a history of urinary tract infection dated at any period from early childhood on to the beginning of pregnancy.

Histories of past infections are given in the order of frequency, exclusive of tuberculosis:

Pyelonephritis and cystitis, adult.
Pyelitis in childhood.
Postmarital cystitis, often with pyelitis.
Cystitis symptoms alone.
Stone associated with infection.

Twenty-seven cases presenting such histories were negative throughout the pregnancy. Six patients were infected when first seen but may not have been free from infection at the beginning of pregnancy.

TABLE 1.—*Type of Infection*

Parity	Infection	Cured in
1	Postmarital infection	3d month
2	Mild postpartum in primipara	2d month
1	Cystitis and right pyelitis of 9 years' standing; thought to be cured but appeared in third month of pregnancy	4th month
1	Pyelitis of pregnancy in second month	8th month
1	Cystitis only early in pregnancy	2d month
5	Cystitis only with cystocele	9th month

In addition to the thirty-three cases, seven patients were seen who were known to have had a preexisting infection present at the beginning of the pregnancy. The type of disease was as follows: pyelonephritis (adult), four cases; postmarital infection, two cases; cystitis symptoms with pyuria, one case.

Of these seven cases, one postmarital infection was cured in pregnancy. The other six patients all developed fever and had symptoms of pyelitis.

From these data it seems probable that the history of cured preexisting infection is not important in prognosis. The majority of infected patients entering on their first pregnancy will have febrile symptoms. From other data, cure in the course of pregnancy is probably not to be expected to occur as frequently as once in seven cases.

CURE IN PREGNANCY

Most observers have agreed that, when infection is present in the urinary tract at the beginning of pregnancy, cure in pregnancy is an extremely rare occurrence. In our clinic we have considered cured patients whose urines are negative for pus cells and bacteria when examined by wet preparation and stained sediment made from centrifugated concentrated urine specimens on at least three successive occasions at intervals of two weeks.

In all types of cases encountered, cure of infection has been proved in only six cases. These are classed in regard to type of infection in table 1.

It is to be noted that cure in pregnancy is most apt to occur in the early months of pregnancy before pelvic and ureteral dilatation take place. One cystitis in a multipara was cured late in pregnancy. One severe pyelitis of pregnancy was cured late in pregnancy.

PERSISTENT INFECTIONS FROM PREVIOUS PREGNANCIES

Fifty-three patients carried infection over between pregnancies into eighty-six pregnancies. Other pathologic conditions in addition to infection were present five times. Two were cortical abscesses in which operation was eventually done during pregnancy. Two cases showed stone, in both of which operation was eventually done between pregnancies; these patients were cured of infection and have had uninfected pregnancies since. One was a cystocele with residual bladder urine. One patient was thought at one stage to be cured in pregnancy but did not prove to be so. All eighty-six pregnancies were infected and renal infection was confirmed by typical symptoms, cystoscopy or both. The majority had intravenous or retrograde pyelography in one or all of the pregnancies.

From these data it seems almost certain that a patient who carries over an infection from a previous pregnancy into the next gestation will have an infected pregnancy.

RELATION OF CURE AND ABSENCE OF INFECTION IN SUBSEQUENT PREGNANCIES

For this study there are twenty-six cases available in which there has been infection of the urinary tract associated with pregnancy, which has been followed immediately by other pregnancies that have been free from infection: Sixteen cases were pyelitis of pregnancy, two of which recurred in the succeeding pregnancy before cure was effected; five were postpartum infections; three were only cystitis, due to constant drainage placed for atonic bladder conditions, and two were associated with other pathologic conditions (stricture) which was treated, and the infection cleared between pregnancies. In one of these the infection was afebrile, in the other severe.

Two of these cases belong to the group in which cure of the infection took place in the course of the first pregnancy. One was a preexisting infection, which disappeared during the first two months of the first pregnancy and remained absent through the second pregnancy; the other was an infection that had been present for two and a half years preceding the first pregnancy, gave rise to a pyelitis in pregnancy which was quite severe, yet disappeared in the eighth month and was followed by one uninfected pregnancy. In one case a cure in pregnancy was questionable but since a postpartum infection appeared on slight provocation the cure is not established.

Of the pyelitis cases, one was severe and was cured during pregnancy; another, associated with stricture, was severe in its onset but subsided, and the patient finished the pregnancy comfortably. The remainder were average cases of the disease.

Two of the postpartum cases were severe; one occurred seven weeks after delivery but was probably not an intercurrent infection. Three cases were mild.

In the three cystitis cases there was no fever.

One of the patients who had two infections in succeeding pregnancies had a severe condition with the first infected (seventh) pregnancy and an afebrile infection with the eighth, but remained uninfected with the ninth.

Seven cases occurred in a group of sixty-three patients in which there was cure of infection between

pregnancies but in which a pyelitis in pregnancy followed. This rate of recurrence is far above the normal incidence of infection in pregnancy, which is now accepted as somewhere about 1 per cent. Either the cure was only apparent or there are other factors that should enter into the picture to explain recurrence of infection. We believe that the latter point of view represents the facts. Economic factors affecting both diet and work in care of the family, water drinking and general hygiene, and the anemias of pregnancy are suggested causal factors.

One patient with very serious pyelitis, with extreme dilatation of the right kidney, became pregnant within three months of the end of the preceding pregnancy but after cure had been effected. There was no infection in the pregnancy.

From these data it appears that cure during the course of pregnancy may occur after a severe infection with pelvic dilatation of considerable degree. Afebrile pyelitis may occur in association with stricture. A severe pyelitis in pregnancy may be followed by an afebrile infection in succeeding pregnancies. Close approximation in pregnancies may occur without infection in the succeeding pregnancies, if cure has been accomplished.

TABLE 2.—*Cases of Infection of the Urinary Tract with Succeeding Pregnancy Free from Infection*

Case	Infection	Parity 1	2	3	4	5	6	7	8	9	10	11
1	Cystitis	0	0	0	0	0	+	0	..	..	..	..
2	Pyelitis	0	0	+	0	..	..	..	..	..	..	..
3	Cystitis	0	0	0	0	0	0	0	0	0	+	0
4	Pyelitis	+	0	..	..	..	..	..	..	..	..	..
5	Pyelitis	+	0	0	..	..	..	..	..	..	..	..
6	Pyelitis	+	0	..	..	..	..	..	..	..	..	..
7	Pyelitis	+	0	..	..	..	..	..	..	..	..	..
8	Pyelitis	+	0	..	..	..	..	..	..	..	..	..
9	Pyelitis	+	+	0	..	..	..	..	..	..	..	..
10	Pyelitis	+	0	0	..	..	..	..	..	..	..	..
11	Postpartum infection	+	0	..	..	..	..	..	..	..	..	..
12	Pyelitis	+	0	..	..	..	..	..	..	..	..	..
13	Preexisting with pyelitis	+	0	Cured in pregnancy								
14	Preexisting	+	0	Cured in pregnancy								
15	Pyelitis	0	0	?	+	0	Probably postpartum after 3					
16	Cystitis	+	0	..	..	..	..	..	..	..	..	..
17	Pyelitis	0	0	0	0	0	0	+	+	0	..	..
18	Pyelitis	0	0	+	+	0	..	..	..	..	..	..
19	Postpartum	0	0	0	0	0	+	0	..	..	..	..
20	Pyelitis	0	0	0	+	0	Strictured ureter					
21	Pyelitis	+	0	..	..	..	..	..	..	..	..	..
22	Pyelitis (afebrile)	0	0	+	0	Strictured ureter						
23	Postpartum	0	0	0	0	0	+	0	..	..	..	..
24	Postpartum	+	0	..	..	..	..	..	..	..	..	..
25	Postpartum	+	0	..	..	..	..	..	..	..	..	..
26	Pyelitis	+	0	..	..	..	..	..	..	..	..	..

TABLE 3.—*Parity in Which First Infection Appeared*

Parity	Number of Cases
1	27
2	7
3	3
4	9
5	2
6	2
7	3
8	3
9	4
10	2
11	0
12	1
Total	63

The important deduction to be drawn from such conflicting data is that the cure of the infection before the beginning of the succeeding pregnancies, even though special treatments or surgery are indicated to produce that result, is the essential consideration.

However, there are scattered cases encountered either when uninfected pregnancies intervene between infected pregnancies or when an infected pregnancy occurs in a series after cure between pregnancies has taken place.

TABLE 4.—*Cases of Recurrence of Urinary Infection in Pregnancy*

Case	Parity 1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	+	+	+	..	..	..	..	..	..	..	..	..	..	..
2	0	0	0	0	0	0	0	0	0	+	+	..	..	..
3	+	?	+	..	..	..	..	..	..	..	..	..	..	..
4	0	+	+	+	+	..	..	..	..	..	..	..	..	..
5	0	0	0	0	0	0	0	+	+	..	..	..	..	..
6	0	0	0	0	0	0	+	+	+	0	..	..	..	..
7	0	+	+	+	..	..	..	..	..	..	..	..	..	..
8	0	0	0	0	0	+	+	..	..	..	..	..	..	..
9	0	?	0	0	+	+	..	..	..	..	..	..	..	..
10	+	+	..	..	..	..	..	..	..	..	..	..	..	..
11	0	0	0	+	+	0	..	..	..	..	..	..	..	..
12	+	+	..	..	..	..	..	..	..	..	..	..	..	..
13	0	+	+	..	..	..	..	..	..	..	..	..	..	..
14	0	0	0	+	+	..	..	..	..	..	..	..	..	..
15	+	+	..	..	..	..	..	..	..	..	..	..	..	..
16	0	0	0	+	+	+	..	..	..	..	..	..	..	..
17	+	0	+	..	..	..	..	..	..	..	..	..	..	..
18	0	0	0	0	0	0	0	+	+	..	..	..	..	..
19	0	+	+	..	..	..	..	..	..	..	..	..	..	..
20	+	+	..	..	..	..	..	..	..	..	..	..	..	..
21	0	0	0	0	+	+	Stone with 5th							
22	0	0	+	+	+	..	..	..	..	..	..	..	..	..
23	0	0	+	+	0	0	0	0	..	..	..	..	..	..
24	0	0	0	0	0	0	0	0	+	+	Stone after 10th			
25	0	+	+	Cortical abscess 2d										
26	+	+	0	..	..	..	..	..	..	..	..	..	..	..
27	+	+	..	..	..	..	..	..	..	..	..	..	..	..
28	+	+	+	+	+	+	..	..	..	..	..	..	..	..
29	0	0	0	0	0	0	0	0	0	+	..	..	..	..
30	+	+	..	..	..	..	..	..	..	..	..	..	..	..
31	+	+	+	..	..	..	..	..	..	..	..	..	..	..
32	0	0	0	+	+	..	..	..	..	..	..	..	..	..
33	+	+	+	..	..	..	..	..	..	..	..	..	..	..
34	0	+	+	..	..	..	..	..	..	..	..	..	..	..
35	0	0	+	+	..	..	..	..	..	..	..	..	..	..
36	0	0	0	0	0	0	+	+	..	..	..	..	..	..
37	+	+	0	..	..	..	..	..	..	..	..	..	..	..
38	0	+	+	..	..	..	..	..	..	..	..	..	..	..
39	+	+	..	..	..	..	..	..	..	..	..	..	..	..
40	+	0	0	0	0	+	..	..	..	..	..	..	..	..
41	0	0	0	+	0	+	..	..	..	..	..	..	..	..
42	0	0	0	0	0	0	0	0	+	+	..	..	..	..
43	0	0	0	0	0	0	0	0	0	0	0	+	..	..
44	+	+	..	..	..	..	..	..	..	..	..	..	..	..
45	0	0	0	0	0	0	0	0	+	+	..	..	..	..
46	0	0	0	0	0	+	+	..	..	..	..	..	..	..
47	+	+	..	..	..	..	..	..	..	..	..	..	..	..
48	0	0	0	+	+	..	..	..	..	..	..	..	..	..
49	0	0	0	0	0	0	0	0	+	..	..	..	..	..
50	0	0	0	0	0	+	+	..	..	..	..	..	..	..
51	+	+	..	..	..	..	..	..	..	..	..	..	..	..
52	+	+	..	..	..	..	..	..	..	..	..	..	..	..
53	+	+	+	+	..	..	..	..	..	..	..	..	..	..
54	+	+	..	..	..	..	..	..	..	..	..	..	..	..
55	+	+	..	..	..	..	..	..	..	..	..	..	..	..
56	0	0	0	+	+	..	..	..	..	..	..	..	..	..
57	+	+	..	..	..	..	..	..	..	..	..	..	..	..
58	0	0	0	0	0	0	0	+	..	..	..	..	..	..
59	+	+	..	..	..	..	..	..	..	..	..	..	..	..
60	+	+	..	..	..	..	..	..	..	..	..	..	..	..
61	+	+	..	..	..	..	..	..	..	..	..	..	..	..
62	0	0	0*	+	..	..	..	..	..	..	..	..	..	..
63	0	0	0	+	+	..	..	..	..	..	..	..	..	..

* An intercurrent pyelitis.

Yet such far greater numbers of cured patients have uninfected pregnancies follow, and infected pregnancies follow when uncured, that this relation is to be considered the logical sequence and the sporadic cases exceptions to the rule.

RELATION OF INFECTED PREGNANCIES IN A SERIES OF PREGNANCIES

There are available sixty-three cases in which there have occurred 299 pregnancies, an average of 4.7 pregnancies per patient. The smallest number of pregnancies is two each, both infected, which occurred in seventeen cases. The largest number of pregnancies was twelve. Of these, 133 pregnancies were infected. Two of the patients had stone and one had cortical abscess. Stone appeared with the fifth pregnancy in one case and with the tenth in another. The cortical abscess appeared in the second pregnancy in a previously uninfected patient. In all cases the following pregnancy was infected also. One case was an intercurrent pyelitis between the second and third pregnancies which was probably not cured, because symptoms persisted although the third pregnancy was afebrile but the fourth was febrile.

Table 3 shows the time in the series at which the first infection appeared. No attempt is made here to indicate either the type of infection, its severity or whether cured between pregnancies, since only the relation of infected pregnancies to other pregnancies is the information desired. In four cases only one infection occurred in a series of ten or more pregnancies.

Of these multiple infections, primiparity marked the onset of the highest number of cases of any gestation. The complete list is given in table 3.

Table 4 shows graphically the location of the infected pregnancies in the series.

From table 4 it is apparent that there is a serial relation between infected pregnancies. There are only three assured cases in which intervening pregnancies were infected. In five cases there were other pregnancies that were uninfected following a series of infected pregnancies. In one of these there were four such pregnancies.

Whatever the factors concerned in producing infection, they appear to persist beyond the single pregnancy, since infected pregnancies appear to occur in series, even though the urine is clear of infection in the interval between pregnancies in some instances.

AFEBRILE INFECTIONS

In a series of multiple infections, some remain afebrile while others produce pronounced symptoms. It is generally recognized that severe pyelitis symptoms may and usually do usher in initial infections; yet such symptoms usually subside, the urine remains purulent throughout the pregnancy, and dilatation of the ureters and pelvis persists. Tolerance for infection seems to have been acquired. It is logical to assume that such tolerance for infection extends beyond a single pregnancy for the following reasons: Of 109 infected pregnancies occurring in fifty-two patients, the initial infection was a severe febrile reaction either as a pyelitis in pregnancy or a postpartum infection in forty-eight cases. In three the first infection was afebrile and in one, mild in character. In the four mild and afebrile cases infection was present for some time before the onset of pregnancy—nine years in the longest standing case and six months in the shortest.

Second infected pregnancies occurred forty-nine times: febrile fifteen times, afebrile twenty-six times and mild eight times.

Third infected pregnancies occurred nine times; two were febrile and seven afebrile.

There seems to be abundant evidence here to support the view that acquired tolerance for infection persists into subsequent pregnancies.

ASSOCIATION OF GROSS RENAL PATHOLOGIC CHANGES WITH INFECTIONS OF THE URINARY TRACT IN PREGNANCY

Gross pathologic changes of the urinary tract is not common in the child-bearing period. Since universal pyelography was not done, no doubt many uninfected lesions were missed. Fifty-five cases of urologic conditions are recorded. The incomplete list in table 5 may serve at least to indicate the variety of lesions encountered.

Cystocele was a very uncertain quantity to estimate but was frequently encountered.

Of this group of "other lesions," all the stone cases except one, all the hydronephroses, strictures and the polycystic kidney were infected during pregnancy.

The malformed ureters and unrotated kidneys were uninfected.

TABLE 5.—*Variety of Lesions Encountered in Series*

Condition	No. of Cases
Calculus (renal 7, ureteral 5)	12
Tuberculosis (chronic 5, acute in pregnancy 1)	6
Hydronephrosis (unilateral 1, bilateral 2)	3
Congenital malformations (unrotated kidney 2, congenital ureter 1, double ureter 1)	4
Strictured ureter	3
Hematuria (unexplained)	3
Endocervicitis (gonorrheal)	4
Cortical abscesses	2
Carbuncle of kidney	1
Incontinence	3
Papilloma	1
Polycystic kidney	1
Retroversion of pregnant uterus with acute retention	1
Voids standing (retroversion)	1
Frequency (trigonitis)	4
Ovarian cyst with bladder symptoms	1
Back strain with bladder symptoms	1
Renal pain before, during and after pregnancy probably explained by ptosis	6

While hematuria has been the initial symptom of pyelitis of pregnancy, on nine occasions hemorrhage from the kidney occurred three times in cases in which there was no other cause assignable except pelvic and ureteral dilatation of the normal type found in pregnancy.

When infection occurred in association with gross pathologic changes it persisted through succeeding pregnancies (with one exception, cystocele) until the underlying condition was remedied and was not always cured then, as in some stone cases. The polycystic kidney remained infected over a period of five years but eventually cleared. The patient had been sterilized soon after the condition was discovered.

It is our practice to correct underlying gross pathologic changes immediately in the course of the pregnancy when conditions demand, but preferably in the intervals between pregnancies. In patients in poor condition it seems wiser to interrupt the pregnancy and make the surgical correction between pregnancies.

It is to be noted that not all gross pathologic conditions become infected during pregnancy.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. WALTHER AND WILLOUGHBY AND DRS. CRABTREE AND PRATHER

DR. A. I. FOLSOM, Dallas, Texas: These two interesting papers give accurate analyses of the sources of urinary infections in pregnant women. Less is known about urinary infections in pregnancy than about anything else in urology. Certain factors seem to indicate that the question of pressure, so far as obstruction is concerned, does not play as great a part as has been thought. I am particularly interested in the part played in these conditions by the posterior portion of the urethra. Drs. Crabtree and Prather recite a number of cases of cystitis. As a rule, they are instances of a long-standing urethritis and not pyelitis. The extension into the bladder is a secondary process. Professor Lichtenstein called attention to the close association between lower urinary tract infection and upper urinary tract infection in men. This is well recognized, but little attention has been paid to the same condition in women. In autopsy specimens in the female bladder I found a large number of papillary masses. This is not a passive thing but a real papillary obstruction, an active inflammatory condition. In the base of the mass there is an active inflammatory area. In some cases the picture is almost identical with a collaret prostate. In some there is a compound structure with many branches, but the long-standing infection produces the collaret appearance just as it is found in the prostate. The long-standing latent infection in these cases is understandable. These infections in the female urethra are aggravated during pregnancy. It does not take much imagination to see that the passage of the head through the birth canal will traumatize tissues and produce trouble. These tissues are composed not of cysts but of definite gland structures, and this focus of inflammatory tissue at the neck of the bladder in pregnant women becomes activated, produces a large amount of irritation, and in many instances leads to an infection which ascends through the lymphatics to the kidney.

DR. G. C. PRATHER, Boston: This idea of secondary infection being due to traumatism of an infected cervix or of a urethral obstruction, according to Dr. Folsom, offers a possible explanation concerning etiology. Many women have an elevation of temperature post partum. The obstetrician reports that there is some infection with pus cells present in the urine, and he wishes to know whether this comes from urinary tract infection or not. These cases offer an interesting problem and, when the fever continues, cystoscopic examination gives extremely valuable information. I do not hesitate to obtain a pyelographic diagnosis in these patients, believing that a continued elevation of temperature from the upper urinary tract, in the absence of an enlarged uterus, indicates a condition that can be improved by cystoscopic or surgical procedures. While our limited experience with pyridium in ambulatory cases was not encouraging, I feel inclined to regard the favorable report of Dr. Walther seriously, for it seems to me that 3,000 cases observed for a sufficient period of time offer adequate data for conclusions. An incidence of postpartum kidney infection of 1.4 per cent during the period 1925-1929 was mentioned. In our first series the incidence of that condition at the Boston Lying-In Hospital was 0.4 per cent of pyelitis in the entire hospital. During the last four years, with more vigorous care, the proportion of postpartum pyelitis has been reduced to 0.25 per cent. The average of only five days of fever after the beginning of cystoscopic treatment in these patients, either by kidney lavage or by constant ureteral drainage, I believe is very creditable, as well as having nearly 50 per cent of the patients with urine normal before leaving the hospital. We do not repeat the cystoscopic procedure in our postpartum series, after the temperature has become normal, until from three to four months has passed, believing that a definite number will clear the urine of bacteria and leukocytes in that time on a forced fluid regimen. If they are not normal by the end of that time they are investigated urologically and treated more actively. In regard to the fact that these ureters and kidneys shrink down quickly after delivery, one observation is interesting, and that is that they do not regain their sensory qualities very quickly, as can be shown by injecting from 15 to 25 cc. through a No. 9 catheter without pain into the postpartum kidney pelvis, which has a normal pyelographic appearance. In other words, these kidneys have shrunk down but have not regained full sensation.

DR. ANSON L. CLARK, Rochester, Minn.: The authors of these papers have focused attention on a condition that should be treated with much closer cooperation between obstetrician and urologist than it has been in the past. Drs. Crabtree and Prather have brought out clearly that cases of infection of the urinary tract which do not recur in subsequent pregnancies are those which have been entirely cleared up following termination of the previous pregnancy. From a urologic standpoint it would seem that, when a patient has had a history of pyelitis in pregnancy, careful bacteriologic study of the condition during the postpartum period should be made. Frequently, considerable attention is paid to the condition and position of the uterus during this time, but often careful bacteriologic examination of the urine is neglected. Six or eight weeks following delivery, sufficient general physiologic recovery of the urinary tract would have taken place to warrant microscopic examination of a stained smear of the catheterized urine and a culture of urine. At this time, should the infection still be present, it would seem to indicate a more concentrated attack entirely to dislodge the infection, which in many cases is practically asymptomatic after such an interval has elapsed. In confirming the belief of Drs. Walther and Willoughly that the possibility of extension from the cervix has been neglected, the work of Richards, reported in THE JOURNAL, Oct. 29, 1932, is of interest. He has proved that transient bacteremia is much more common than it usually is considered to be. Immediately following trauma to possible foci of infection, the organism was yielded by cultures of the blood in from 10 to 20 per cent of the cases. One hour later, blood cultures in practically all the cases, excepting those involving the tonsil as a focus, were negative. If one is to believe that the hematogenous route of infection is to be considered in infections of the urinary tract, this work is extremely interesting. I cannot agree with Walther and Willoughby in their recommendations as to the use of pyridium. Gillespie, in his work with Helmholz, has conclusively proved that pyridium in aqueous solution is bactericidal but that pyridium in a solution of urine at stronger concentration than it is possible to pass through the urinary tract is not bactericidal. This was confirmed by Edwin Davis one year ago. I would urge that, in the majority of cases of postpartum infection, inhibition of the growth of the offending organism be effected before investigation by ureteral catheterization, which might cause trauma, is instituted. Marked acidification of the urine by either ammonium nitrate or ammonium chloride given orally would seem advisable before deciding that drainage by catheter of the upper part of the urinary tract is necessary. My experience has shown numerous cases in which too early catheterization of the upper part of the urinary tract, in the presence of a virulent infection, has led to complications rather than to amelioration of the condition.

DR. J. I. HOFBAUER, Baltimore: More emphasis should be placed on atony of the ureter during pregnancy, rather than dilatation. I cannot understand how the ureter may be supposed to dilate during early pregnancy by reason of uterine pressure, as the ureter does not come in contact with the uterine wall to any extent in the early months of pregnancy. Lowering of the surface tension of the blood primarily accounts for ureteral atony in pregnant women. An excellent piece of work, recently published by the Mayo Clinic, in corroboration, demonstrates decrease of tone of the biliary ducts during pregnancy. During the sixth and seventh months of pregnancy, when the ureter comes in close contact with the uterus, the atonic ureter is displaced outward. The juxtavesical portion of the ureter does not dilate in normal pregnancy but it may dilate in cases of pyelitis of pregnancy. Infection adds another element for the occurrence of atony, and this is demonstrable on the screen. Why does the right ureter more often show dilatation during pregnancy than the left? In my opinion this is due to the fact that the uterus, as a rule, lies in definite torsion to the right. Realizing that in the later months of pregnancy, owing to the formation of the lower uterine seg-

ment, the bladder is pushed forward and to the right, I feel that the left ureter is put on a stretch, while the right ureter angulates at the point where it traverses the parametrium. Why is it that pyelitis does not occur in every case of ureteral dilatation, in the presence of bacteria? The third determining factor is the lowering of the resistance of the organism. My studies have shown that in pregnant women there occurs a lowering of resistance to B. coli in about nine out of a hundred cases. The same phenomenon occurs in women following labor when there is excessive loss of blood. With the idea of possibly preventing the occurrence of pyelitis by stimulating the peristaltic activity of the ureter, I now give pregnant women from the fifth month of pregnancy on calcium and potassium citrate in large doses and twice a week ephedrine orally and have reduced the occurrence of pyelitis to about ⅓ per cent.

DR. E. G. CRABTREE, Boston: There was no doubt that the cases to which Dr. Folsom referred were cases of cystitis without involvement of the upper urinary tract. Absence of upper urinary tract infection, while not proved in every case, was demonstrated in some. Residual urine during the course of pregnancy has been mentioned. After several years of following our cases in this regard we do not find residual urine except in rather unusual conditions and when there is a cystocele. Dr. Hofbauer has brought up many interesting questions. I assign a double cause for the dilatation of the ureter and pelvis in pregnancy. This is atony of the ureter and pelvis as a result of endocrine changes due to pregnancy and pressure applied by the uterus at the brim of the pelvis. It may be recalled that Jacoby a number of years ago contended that the whole body of the pregnant woman undergoes loss of tone. This loss of tone in the ureter and pelvis undoubtedly takes place throughout its course, yet only that portion of the ureter dilates which is situated above the point of pressure at the brim of the pelvis. Hypertrophic conditions, which Dr. Hofbauer has accurately reported, at the ureterovesical junction and lower part of the ureter do occur but I do not believe that they play much part in the production of the dilatation, because, as indicated by Kretschmer, the lower portion of the ureter does not, as a rule, take part in the ureteral dilatation. I explain lateral displacement of the ureter by recalling that the ureter is more adherent to the peritoneum than to the postureteral tissue; therefore peritoneal stretching will carry the ureter beyond its normal position.

DR. H. W. E. WALTHER, New Orleans: The trail blazers in the field of postpartum urinary sepsis have been Hofbauer, Crabtree and Prather, and I wish to pay them respectful tribute. It has been the stimulating tenor of their work that has encouraged us to carry on with our study. We shall continue our work with pyridium in order to report later whether we feel the same as some do or whether we shall retain our present high regard for this dye antiseptic. Certainly no convincing evidence has yet been advanced to show that pyridium, when administered in proper dosage and over a sufficient period of time, is not therapeutically effective. Davis attempted to solve this problem by showing that bacteria would grow in the voided urine of normal medical students who had taken various dyes by mouth. Helmholz substitutes rabbits for test tubes. Neither of these studies proves anything of clinical value. Physicians are not called on to treat test tubes or rabbits. Admitting the intricacy of investigations in dye therapy, we do not feel that the final evaluation of pyridium will be settled in the laboratory.

Observational Ability.—Diagnostic success at the bedside may be held to depend firstly upon the historical analysis, and secondly upon our personal powers of observation, both of which are subject to the continual leaven of experience. Nothing is so variable as observational ability. Some have it well developed from childhood, men of the naturalist type. Some never acquire any facility for it, and repeatedly miss the obvious. The majority cultivate their aptitudes by degrees and adopt a middle level. Most of us improve with time and practice, but many take but little pains to refine and to register experience, and, for this reason, retard their progress in the clinical arts.—Ryle, J. A.: The Training and Use of the Senses in Clinical Work, *Guy's Hosp. Gaz.* **47**:421 (Oct. 28) 1933.

PATHOLOGIC PHYSIOLOGY OF TERATOMA TESTIS

RUSSELL S. FERGUSON, M.D.
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Observations pointing to the direct relation of specific tumors to certain ductless glands are increasing. To this number the relation of teratoma testis to the anterior lobe of the pituitary may now be added.

Since December, 1930, there have been observed at the Memorial Hospital 117 consecutive cases of tera-

Fig. 1.—Teratoma of the testis. Embryonal adenocarcinoma.

toma testis in which the quantitative excretion of prolan A (the follicle-ripening hormone of the anterior pituitary body) has been determined by multiple observations. The technic of the quantitative modification

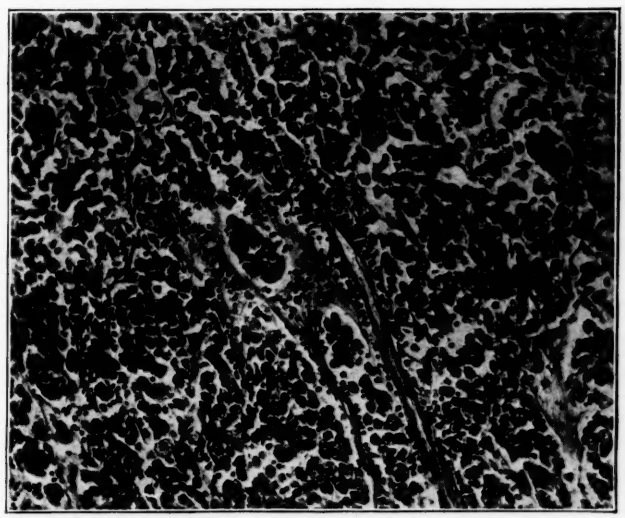


Fig. 2.—Teratoma of the testis. Embryonal carcinoma with lymphoid stroma.

of the Aschheim-Zondek test [1] has been published elsewhere and need not be repeated at this time.

From the Memorial Hospital.
Read before the Section on Pathology and Physiology at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 14, 1933.

1. Aschheim, S., and Zondek, B.: Klin. Wchnschr. **7**: 1404, 1928. Ferguson, R. S.; Downes, H. R.; Ellis, E., and Nicholson, M. E.: Am. J. Cancer **15**: 835 (April) 1931. Ferguson, R. S.: ibid. **18**: 269-295, 1933.

In all the cases in this series in which the tumor had been unaffected by treatment, prolan A was found in the urine in varying amounts. The factors which determine the urinary excretion of prolan A are as follows: (1) the embryonal character of the tumor, (2) the extent of the disease and (3) the effect of treatment.

OBSERVATIONS

No cases of chorionepithelioma of the testis appear in this series. On the basis of the published observations of Heidrich, Fels and Mathias [2] and comparable observations in cases of chorionepithelioma of the uterus, it is safe to assume that this tumor will cause the excretion of prolan A in the urine in excess of 50,000 mouse units per liter.

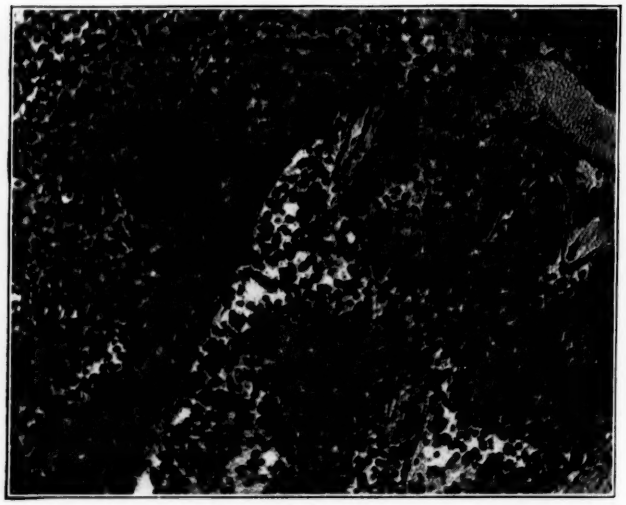


Fig. 3.—Teratoma of the testis, seminoma type.

In this series there were seven cases of embryonal adenocarcinoma of the testis which were uninfluenced by treatment at the time of the first assay of the urine. The excretion of prolan A ranged from 10,000 to 40,000 mouse units per liter in each case (fig. 1).

In fifteen cases of embryonal carcinoma with lymphoid stroma, uninfluenced by treatment, the output of hormone varied from 2,000 to 10,000 mouse units per liter of urine (fig. 2). Ten cases of seminoma were observed. The excretion of prolan A varied from 400 to 2,000 units per liter (fig. 3).

In five cases with adult types of teratoma the output of prolan A varied from 50 to 500 mouse units per liter (fig. 4).

Fig. 4.—Teratoma of the testis, adult type.

It will be seen, therefore, that the quantitative excretion of prolan A is a definite indication of the structural type of the tumor. In fact, the limits reached by each type overlap so little that it is possible to make the diagnosis on the basis of this determination alone.

It has been observed repeatedly in this series that tumors of like structure vary with the extent or mass of the disease. For example, in a case of embryonal carcinoma with lymphoid stroma, without metastases, the excretion of prolan A may be only 2,000 units per liter. In a second case with widespread metastases the excretion may reach 10,000 units per liter.[3] Likewise, wide fluctuations have been observed in the same case. With a small mass of tumor the output in case 49 was only 2,000 units per liter; later, when widespread metastases were present, the output reached 10,000 units of prolan A per liter of urine (fig. 5).

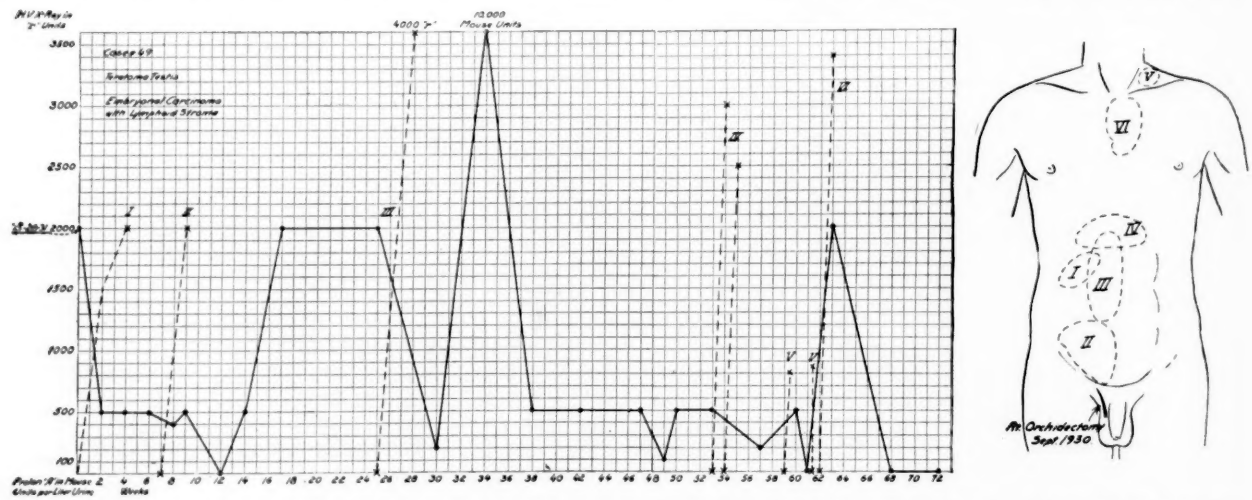


Fig. 5.—Patient F. S. Embryonal carcinoma with lymphoid stroma. The solid line indicates excretion of prolan A in mouse units per liter. The dotted line indicates irradiation in roentgens. The Roman numerals indicate treatment directed to recurrence of the same number as in the diagram.

2. Heidrich, L.; Fels, E., and Mathias, E.: Beitr. z. klin. Chir. **150**: 349, 1930.

3. Ferguson, R. S.: S. Clin. North America **13**: 483-487 (April) 1933.

THE EFFECT OF TREATMENT

Observations on the effect of treatment on the excretion of prolan A in teratoma testis are practically confined to the effect of irradiation. The 117 patients in this series were treated by means of high voltage roentgen therapy or radium element pack. In 5 cases the excretion of prolan A was unaffected by maximum doses of radiation. In such instances the prognosis is bad, and these patients are either dead or dying (fig. 6).

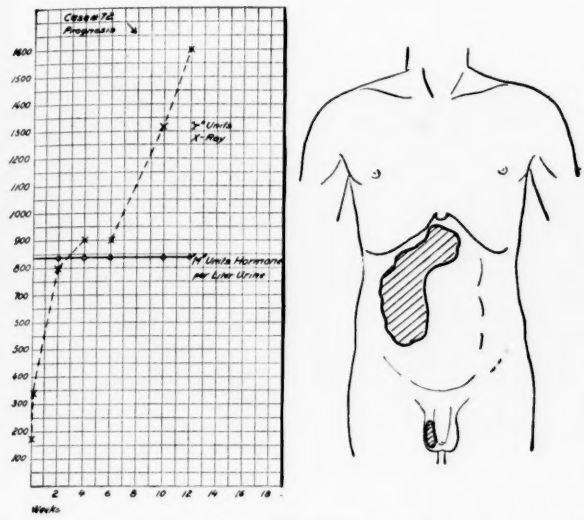


Fig. 6.—Patient I. A. Excretion of prolan A unaffected by high voltage x-rays. Prognosis bad.

In the majority, however, irradiation of the primary tumor or its metastases caused a drop in the excretion of prolan A in the urine, the rapidity and extent of which are good indexes of the radiosensitivity of the tumor, and reliable factors on which to base the prognosis. In case 71 the rapidity of the drop in excretion of hormone and the effect of the irradiation on the tumor are shown in figures 7 and 8.

With respect to the surgical removal of the primary tumor in cases without metastasis, if the presence of a measurable output of prolan A before operation may be assumed, the prolan is known to be absent as soon as seven days after operation.

As already observed, irradiation of the primary tumor and its metastases causes a decrease in the excretion of prolan A in most instances. In these cases there is a coincident decrease in the size of the tumor and its metastases, and in favorable cases a total disappearance of the same. In three instances the pituitary gland has been irradiated, and while there was an easily demonstrable reduction in the excretion of prolan A in the urine, there was no measurable reduction in the size of the tumor or its metastases.[4] At the same time it could not be said that the tumors increased in size.

4. Ferguson, R. S.: Am. J. Roentgenol. **29**: 443-447 (April) 1933.

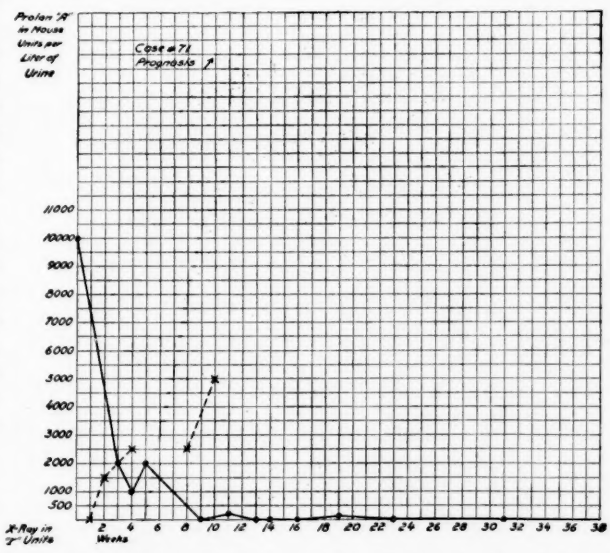
RECURRENCE AND METASTASIS

The effect of recurrence and metastases on the excretion of prolan A has been observed repeatedly. The metastatic lesions of teratoma distribute themselves in the abdominal and mediastinal lymph nodes and through the venous circulation into the lungs. In these locations it is difficult to detect their presence early by clinical methods. In all of the recurrent cases in this series an increase in the excretion of prolan A in the urine was observed anywhere from two weeks to three months before the metastatic lesions became clinically demonstrable (fig. 5).

PHYSIOLOGIC EFFECT OF PROLAN A ON GENITAL EPITHELIUM

The increased secretion of prolan A occasioned by the presence of a teratoid tumor in the host produces profound changes in the genital epithelium of young subjects. Ten cases in this series came to autopsy. In each there was an easily demonstrable hyperplasia of the epithelium in the prostate and seminal vesicles. This reached such proportions, in cases succumbing with a high output of prolan A, that the prostate was indistinguishable from that of the benign hypertrophy of old age, except for the fact that the muscle and stroma took little part in the hyperplasia (figs. 9 and 10). In the opposite testis of such cases there is a constant hyperplasia of the interstitial cells with atrophy of the seminal epithelium (fig. 11). The pituitary body constantly shows the basophilic hyperplasia typical of pregnancy (fig. 12).

Prolan A has been demonstrated in the tumor tissue in all the cases in which autopsies have been made. The amount is usually comparable with that found in the urine just before death.



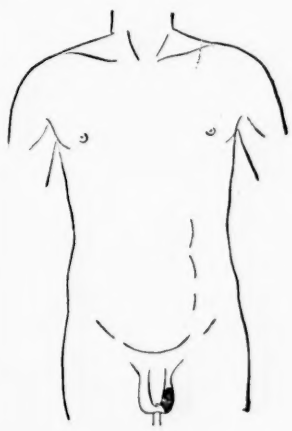


Fig. 7.—Patient H. S. Prompt disappearance of prolan A from the urine in a radiosensitive teratoma of the testis. Prognosis good.

COMMENT

The cause of the appearance of prolan A in the urine of patients with teratoma testis is a subject for speculation. The most likely possibility presumes that the origin and growth of the embryonal tumor produce a hormone, not yet identified, that stimulates the anterior lobe of the pituitary body to secrete an increased amount of prolan A. In support of this contention, the identical structural changes observed in the anterior

lobe of the pituitary body in cases of normal pregnancy, chorionepithelioma in the female, teratoid tumors in the male and certain other neoplastic diseases accompanied by high outputs of prolan A in the urine may be cited. The hyperplasia of the basophilic cells of the anterior lobe is a characteristic feature in all of these cases. Zondek,[5] in a recent paper, has produced exact evidence tending to prove that the basophilic cell of the anterior lobe is responsible for the secretion of prolan A. Further, roentgen irradiation of the pituitary body in

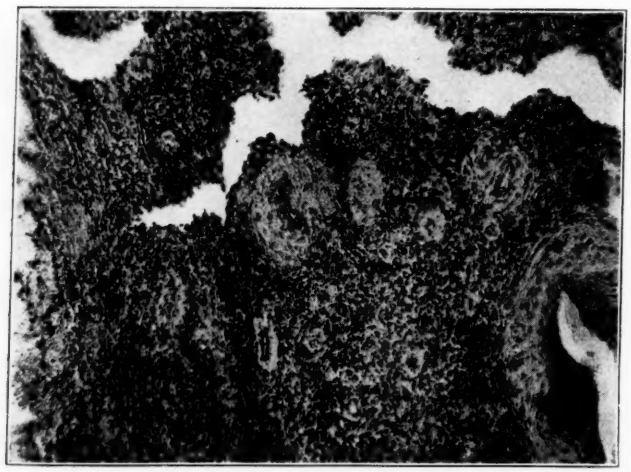


Fig. 8.—The tumor from case 71 (fig. 7) removed six weeks after completion of irradiation. Note entire destruction of this radiosensitive teratoma.

cases of teratoid tumor of the testis causes a temporary decrease in the excretion of prolan A in the urine. The beneficial results of preliminary irradiation of the pituitary body in cases of corpus carcinoma, as reported

Fig. 9.—Hypertrophy of the seminal vesicles with the true epithelial hyperplasia due to the sex hormone of the anterior hypophysis. (Autopsy, Patient N. D.)

by Voltz to the League of Nations Committee, would appear to be predicated on the fact that, in many of these cases, excessive amounts of prolan A are secreted in the urine (Zondek[6]).

This theory also agrees with a corollary which has many ramifications, namely, that prolan A is essential to the growth of embryonal tumors of the testis. It has been shown by Zondek with direct tumor transplants, and by me with tumor extracts, that these tissues contain more prolan A than can be found in an equal volume of blood. It is here shown that irradiation of the primary tumor or its metastases causes a decrease in the excretion of prolan A in the urine. Irradiation of the hormone ex vivo is without effect. The total disappearance of the hormone from the urine coincides with the clinical disappearance of the tumor and its metastases, without any treatment having been directed at the pituitary body. The hormone reappears in the urine whenever the tumor recurs. This would seem to prove that the tumor requires prolan A as an essential to growth, and that the tumor actually produces a precursor which stimulates the anterior lobe of the pituitary body to secrete prolan A. In further support of the main theory and its corollary is the evidence herein deduced that the quantitative production and excretion of prolan A are in direct proportion to the growth rate of the tumor, since the more rapidly growing embryonal tumors cause the production of larger amounts than the more adult types.

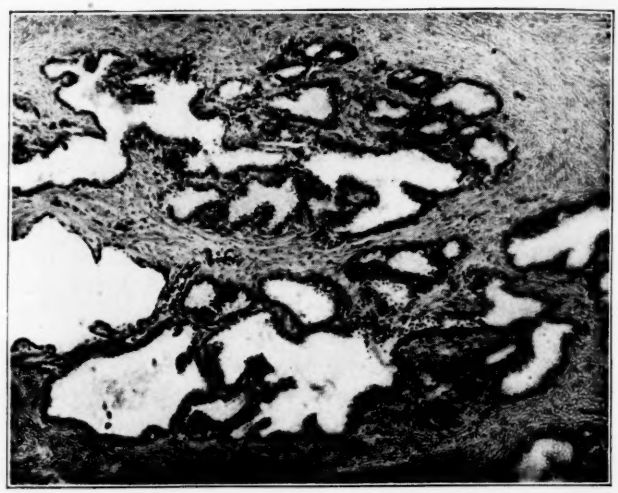


Fig. 10.—Hypertrophy and epithelial hyperplasia of the prostate. (Autopsy, patient N. D.)

To one directly engaged in such studies the conclusion is inescapable that the biologic approach to the study of the disturbed endocrine physiology of the tumor host is a fertile and until recently untilled field of cancer research. That this conclusion is not unwarranted in fact is shown by the present study and by the work of Jaffe and others on the relation of the parathyroid to osteitis fibrosa and by unpublished studies from this laboratory which show a direct relation between the middle lobe of the pituitary body and melanoma. The practical applications of such studies to diagnostic methods and the control of therapy are suggested in the results herein reported.

SUMMARY

1. The factors determining the quantitative excretion of prolan A in the urine in 117 cases of teratoma testis are briefly enumerated.

2. It is shown that the excretion of prolan A is determined by the embryonal character of the tumor, the extent of the disease and the effect of treatment.

3. The effect of recurrence and metastasis on the excretion of prolan A in cases of teratoma testis is described.

5. Zondek, B.: Klin. Wchnschr. **12**: 22-25 (Jan. 7) 1933.
6. Zondek, B.: Klin. Wchnschr. **11**: 274-279 (Feb. 13) 1932; Monatschr. f. Geburtsh. u. Gynäk. **89**: 370, 1931.

4. The structural and physiologic changes in the prostate, vesicles, testes and pituitary body of the tumor host are enumerated.

5. The significance of the foregoing findings is discussed.

ABSTRACT OF DISCUSSION

DR. FRANK W. HARTMAN, Detroit: The constant application and refinement of these tests are more important than the original application and discovery. I should like to ask

Fig. 11.—Hyperplasia of Leydig's cells in the remaining testis. (Autopsy, patient N. D.)

Dr. Ferguson the details of his test, what animals he uses, whether he has to concentrate the urine, and a few practical points that would be of great interest to all.

DR. R. S. FERGUSON, New York: The details of the quantitative technic are rather lengthy. They appear in the

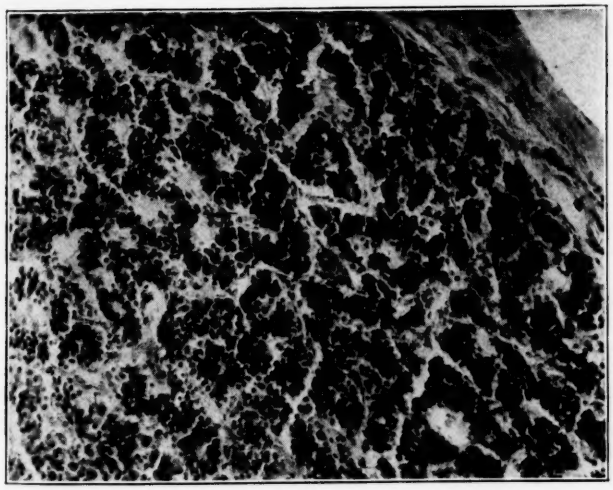


Fig. 12.—Anterior lobe of the pituitary, showing basophilic hyperplasia. (Autopsy, patient N. D.)

June issue of the *American Journal of Cancer*. The whole procedure is totally useless and will come into immediate disrepute if observers insist on doing qualitative tests for prolan A and, on finding nothing, state that the whole procedure is useless. No qualitative Aschheim-Zondek test on rabbits, rats, mice or any other animal is sufficient to demonstrate less than 2,000 units per liter as a gross reaction. Therefore, more than 33 per cent of the value of the work will be immediately lost, because one third of the tumors do not secrete 2,000 units per liter; yet that is not to say that they do not secrete prolan A; it is to say that it has not been found. I would emphasize that the quantitative method, making an extract of the urine and assaying the extract down to quantities as low as 100 units per liter, is essential to results. Likewise, in studying teratoma, it is essential to make repeated examinations, week after week, as the cases are under treatment.

CUTANEOUS ULCERS TREATED BY THE SULPHYDRYL CONTAINING AMINO-ACID CYSTEINE

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AND
DAISY G. SIMONSEN, PH.D.
ROCHESTER, MINN.

The treatment of cutaneous ulcers by sulphydryl compounds is a clinical application of the investigations of Hammett [1] and of Hammett and Reimann,[2] who found, in a long series of experiments on plants, lower animals and man, that there is a positive correlation between the sulphydryl (SH^-) group and cellular activity. Reimann [3] reported favorably on the treatment of obstinate cutaneous ulcers by means of thiocresol, which contains sulphydryl attached to the benzene nucleus. Dressings were saturated with a solution of thiocresol, diluted 1 : 10,000, and applied to the wounds for periods of a few days, alternating with bland treatment for a similar period. There were distinct spurts of healing during the time the thiocresol was applied, as shown by epithelial growth and a change in the character and amount of granulation tissue.

Following the separation of glutathione in crystalline form, Kendall [4] suggested to us the use, in a similar practical fashion, of this naturally occurring substance which contains sulphydryl. Reduced glutathione contains the sulphydryl group in the form of the amino-acid cysteine, together with glutamic acid and glycine. Glutathione is found in all living tissues and probably plays an important part in cellular metabolism in regard to the activation of enzymes.[5]

We applied reduced glutathione to certain types of cutaneous ulcers and noted a definite stimulation of growth in the treated portions. On account of the expense involved, it was considered impracticable to carry on the extensive use of glutathione, once the academic question of its usefulness had been settled, and for that reason the amino-acid cysteine was substituted. This report deals with the experience gained in a period of three years of the practical use of cysteine in the treatment of selected cases of cutaneous ulcer in the Mayo Clinic, both in ambulatory and in hospital practice.

Read before the Section on Dermatology and Syphilology, at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 14, 1933.

From the Section on Dermatology and Syphilology, the Mayo Clinic (Louis A. Brunsting); and work done (Daisy G. Simonsen) while a Fellow in Chemistry, the Mayo Foundation.

1. Hammett, F. S.: The Chemical Stimulus Essential for Growth by Increase in Cell Number, Protoplasma **7**: 297-322, 1929; The Proliferative Reaction of the Skin to Sulfhydryl and Its Biological Significance, ibid. **13**: 331-347, 1931.

2. Hammett, F. S., and Reimann, S. P.: Cell Proliferation Response to Sulfhydryl in Mammals, J. Exper. Med. **50**: 445-448 (Oct.) 1929; Cell Proliferation Response to Sulphydryl in Man, Proc. Soc. Exper. Biol. & Med. **27**: 20-22 (Oct.) 1929.

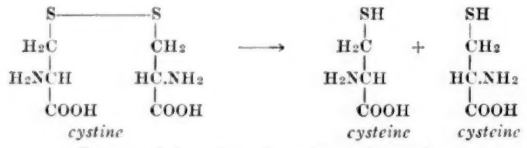
3. Reimann, S. P.: Use and Reasons for the Use of Thiocresol to Stimulate Wound Healing, J. A. M. A. **94**: 1369-1371 (May 3) 1930.

4. Kendall, E. C.; McKenzie, B. F., and Mason, H. L.: A Study of Glutathione: I. Its Preparation in Crystalline Form and Its Identification, J. Biol. Chem. **84**: 657-674 (Nov.) 1929.

5. Kendall, E. C.: Personal communication to the authors.

PREPARATION OF CYSTEINE AND METHOD OF APPLICATION

Cysteine was prepared by the method of Gortner and Hoffman[6] from the hair of man. Such keratin-containing structures as hair, nails, hoofs, horns and sheep wool are particularly rich in sulphur, most of which is present in the form of the disulphide cystine.[7] By hydrolysis, hair is converted to cystine, when it is reduced by tin and hydrochloric acid to cysteine hydrochloride. Cysteine (SH^-) is readily oxidized to cystine (S-S) by exposure to air, but can be kept indefinitely in the form of the hydrochloride.[8]



Structural formulas of cystine and cysteine.

Cysteine was made up in a concentration of 0.5 per cent, the solution containing equal parts of physiologic solution of sodium chloride and distilled water. The hydrochloric acid of the cysteine hydrochloride was neutralized with sodium hydroxide to a p_H of 7.0. One gram of cysteine hydrochloride requires 6.35 cc. of normal sodium hydroxide or its equivalent. The neutralized solution should be used within twenty-four hours; however, in well filled bottles we were able to keep it in refrigeration for several days without much loss. Dressings were changed twice daily, or more often if there was much drainage.

In our experience, cysteine is not only fully as efficient as thiocresol in stimulating qualities, but it possesses two decided advantages from a practical standpoint. It is without the unpleasant, penetrating odor resembling burnt rubber, common to all volatile sulphydryl compounds. Furthermore, cysteine is less irritating than thiocresol to the surface of skin adjoining the ulcers. The wet dressings, of course, contribute to a certain degree of sogginess in either case, unless care is taken to alternate the treatment with periods of drying.

OBSERVATIONS

More than 200 patients were subjected to treatment by cysteine; a varied assortment of ulcerative lesions were represented. The most common were varicose ulcers usually associated with varicose veins. Most of these had resisted routine measures of treatment and were of a chronic, indolent type. Treatment with cysteine was used alone or in conjunction with measures concerned with relieving the static edema, such as supportive bandages, or obliterating injections into the varicose veins. In dressings of cysteine, when applied to ulcers about the lower parts of the legs, firm pressure was usually exerted by means of a soft rubber sponge incorporated in the elastic bandage that was wound from foot to knee. In a number of cases of bilateral involvement the following procedure was employed: The basic treatment of the ulcers of both legs was the same throughout, but for a time cysteine would be added for treatment of the ulcers on one leg; then the cysteine would be omitted in treatment of that leg and applied in treatment of the other. Whenever cysteine was employed, the ulcers to which it was applied advanced toward healing more rapidly than those on the other leg. Thus, a system of alternate control allowed adequate evaluation of the effect of cysteine.

Certain traumatic ulcers, variously situated, were treated with cysteine. The following case is illustrative:

CASE 1.—A girl, aged 18, sustained a deep laceration of the posterior aspect of the upper part of the right arm, the result of an automobile accident, July 4, 1930. After preliminary débridement, the fascia and skin were approximated by silk and dermal sutures. About half of the incision failed to heal, and a raw necrotic wound remained. When treatment by cysteine was begun, August 4, there was a large ulcer, fairly clean, representing a denuded area measuring about 5 by 15 cm. Within twenty-four hours there was evident a striking degree of stimulation of the hitherto dormant granulation tissue and of the epithelial margins of the wound. Cysteine was used intermittently for three or four days at a time, alternating with ointments of weak balsam of Peru for a similar time. Within twenty-one days epithelization was complete (figs. 1, 2 and 3). The epithelium was rather thin, probably because of its rapid growth; after six weeks a small vesicle appeared, and a slight break of the covering of the surface. Cysteine was applied for four or five days and healing was complete. There was no further trouble.

In postoperative wounds, the stimulating properties of cysteine were valuable. One such case is illustrated by the following report:

CASE 2.—A man, aged 45, was seen thirty-seven days after posterior gastro-enterostomy for chronic duodenal ulcer. The abdominal wound had healed except for a residual sinus 2 cm.

Fig. 1 (case 1).—Traumatic ulcer of the upper part of the right arm before treatment.

long, 1 cm. wide and 2 cm. deep. There was considerable seropurulent exudate, and the granulation tissues were pale. A probe revealed the cutaneous margins to be undermined about 2 cm. in all directions. Routine measures, including treatment by stimulants and by ultraviolet rays from the mercury vapor arc in quartz for three weeks, had brought about little change in the size or appearance of the wound. Within forty-eight hours after application of dressings of cysteine were begun, drainage practically ceased, granulations became red and exuberant, and within fourteen days healing was complete.

In the care of decubital and trophic ulcers we found cysteine to be useful, although of limited application. In these types of intractable ulcerations, treatment by local measures is usually handicapped by disturbances of the general health. However, there was a certain amount of stimulation of granulation tissue following application of cysteine, and secondary bacterial overgrowth was inhibited. In several cases of decubital

6. Gortner, R. A., and Hoffman, W. F.: L'Cystine, in Marvel, C. S.: Organic Synthesis, New York, J. Wiley & Sons, Inc., 1925, vol. 5, p. 39.

7. Lewis, H. B.: Sulfur Metabolism, Physiol. Rev. **4**: 394-423 (July) 1924. Marston, H. R.: The Chemical Composition of Wool with Especial Reference to the Protein of Wool-Fiber (Keratin), Australia Council for Scientific and Industrial Research, Melbourne, Bull. 38, 1928. Marston, H. R., and Robertson, T. B.: The Utilization of Sulfur by Animals, Australia Council for Scientific and Industrial Research, Melbourne, Bull. 39, 1929. Brown, Herman and Klauder, J. V.: Sulphur Content of Hair and of Nails in Abnormal States: Therapeutic Value of Hydrolyzed Wool; I. Hair, Arch. Dermat. & Syph. **27**: 584-604 (April) 1933.

8. Cysteine hydrochloride is obtainable from Eastman Kodak Company, Rochester, N. Y.

ulcers, cysteine applied at intervals apparently shortened the period of hospitalization.

In carbuncles, after suppuration, cysteine is efficient in promoting the growth of granulation tissue. There is usually more prompt sloughing of the necrotic sphacelus and a cleaner base when cysteine is used. In three instances of extensive carbuncle of the neck and back, such treatment contributed to the earlier and successful use of skin grafts, and to healing of the wounds with a minimum of deformity.

Fig. 2 (case 1).—Appearance of ulcer treated by cysteine after fourteen days.

In extensively denuded surfaces, such as occur in burns from gasoline, the securing of satisfactory epithelization without disabling deformity presents a problem. If multiple pinch skin grafts are applied to the denuded surface, there is a higher percentage of successful "takes" when cysteine is used. The dressings are applied to the granulating surface before grafting, and to the grafted regions at intervals following, using perforated protective strips to prevent mechanical displacement of the grafts. Case 3 is an example.

CASE 3.—A man, aged 24, was severely burned by an explosion of gasoline, Aug. 30, 1929. He was admitted to the Mayo Clinic in the spring of 1930, critically ill with legs and hands covered with old burns of second degree. Treatment was carried out by prolonged immersion in warm baths and other supportive measures. The patient was in poor condition, and frequent transfusions of blood were given. Progress was slow, and was interrupted by febrile periods which probably were due to the secondary infection in the extensively denuded regions. By the middle of July there was sufficient general improvement to warrant application of stimulating measures to the ulcers of the legs. Cysteine was applied to the left thigh as a trial, with prompt stimulation of the granulation tissues resulting. Within from ten to fourteen days a few islands of epithelium had appeared, and drainage from the treated surface was at a minimum. Cysteine was used in various portions of the wounds as the patient's condition permitted the use of wet dressings. In December, seventy-five pinch grafts were applied with unsuccessful results. This procedure was repeated, and cysteine was applied over half of the grafts. There was decided improvement in the region to which cysteine had been applied. Granulations were richer, and the grafts were more successful than in the untreated portions. In this fashion the right leg became completely healed by January, 1931. In March, 120 grafts were made to the left leg posteriorly, and dressings of cysteine were applied over perforated strips smeared with petrolatum placed over the fresh grafts. Treatment by stimulation was continued intermittently until May 11, at which time healing was almost complete. The patient was dismissed in August, 1931. Examination one year later revealed an excellent epithelial covering with little deformity. This case is a good example of the usefulness of cysteine in clearing secondary infection to permit of skin grafting in extensive wounds.

In such conditions as roentgen ulcers, one would expect little benefit from stimulating preparations. However, we have observed that in such wounds, if residua of epitheliomatous degeneration have been removed by cautery, healing is perhaps accelerated when cysteine is used at intervals, especially when skin grafts are a part of the reconstructive procedure.

Several scrofulous sinuses, Bazin ulcers and nodulo-ulcerative syphilids were somewhat cleared of secondary infection by dressings of cysteine, without, of course, any effect on the underlying constitutional disturbance.

Cysteine was used without appreciable effect, in a few cases of miscellaneous cutaneous lesions, psoriasis, pustular psoriasis, lichen simplex chronicus and lichen planus.

COMMENT

Two decided changes were brought about in ulcers following the use of cysteine: first, stimulation of granulation tissue and epithelial proliferation, and second, diminution of drainage, with clearing of secondary infection. In the entire group of 200 cases of ulcer treated with cysteine, there was decided stimulation to healing in 50 per cent; in 25 per cent, the beneficial effect was promising; in the remainder, the results were desultory. In only three or four instances was it necessary to discontinue the treatment because of the discomfort and irritation provoked at the periphery of the ulcers under treatment. Best results were obtained when cysteine was used in alternation with periods of dry, bland treatment, each of two or three days' duration. It was observed that the stimulating properties

Fig. 3 (case 1).—Appearance of ulcer after twenty-one days; complete epithelization.

of cysteine were less pronounced when healing was near completion. Many of the lesions progressed rapidly until about from 80 to 90 per cent of the area was covered with epithelium, at which point stimulation by cysteine ceased.

The inhibition of bacterial growth by cysteine is difficult to explain. Hammett and Reimann found in wounds treated by thioglucose that there was decided bacterial overgrowth. In fact, Welsh,[9] in unpublished

9. Welsh, A. L.: Personal communication to the authors.

experiments on cysteine in vitro, found that in concentration of sulphur of 1:20,000 there was a decided stimulus to growth of certain organisms, the cocci in particular. The cleanness of wounds under treatment by cysteine may possibly be attributed to the wet dressings or perhaps to the elaboration of unknown products by cells of the epithelium or of the granulation tissue in the process of rapid healing.

The use of this compound, in conjunction with multiple pinch grafts in extensive ulceration, gave satisfactory results. There was a larger number of successful "takes" in areas where cysteine was used than in areas treated for purposes of control, by routine methods. In certain instances where grafting had been unsuccessful on previous attempts, there was a better average of "takes" following the use of cysteine. It was essential, of course, preliminary to the laying of grafts by various methods, that the bed of granulation tissue should be vascular and slightly exuberant, to which end the use of cysteine was particularly applicable.

From the practical standpoint, in the treatment of ulcers in general the use of cysteine is advocated, not as a substitute for the well established procedures in common use, but as an adjunct to the treatment of more resistant cases.

Cysteine is active only in its reduced, sulphydryl form (SH^-). After oxidation to the disulphide, cystine (S-S), the compound is inert. For this reason it is necessary to emphasize the need for freshly prepared material, applied at frequent intervals. We were unable to demonstrate in the examination of old dressings whether there was oxidation of the compound beyond the disulphide stage. Quantitative studies as to the amount of cysteine absorbed in various stages of healing are as yet incomplete.

SUMMARY AND CONCLUSIONS

The observation of Hammett and Reimann of the stimulating properties of certain sulphydryl-containing compounds is confirmed.

Cysteine, a naturally occurring sulphydryl containing amino-acid, obtained by the reduction of the disulphide cystine, a product of the hydrolysis of wool or of the hair of man, is capable of stimulating granulation tissue and epithelium. When applied to cutaneous wounds and ulcers, bacterial growth is inhibited.

This report brings out the practical value of cysteine as used in the Mayo Clinic in the last three years in more than 200 cases of a variety of types of cutaneous ulcer.

ABSTRACT OF DISCUSSION

DR. JOSEPH V. KLAUDER, Philadelphia: The story of sulphur, one of the oldest remedies known to man, is of particular interest to the dermatologist. As an antiparasitic and employed in the bath, sulphur was one of the earliest drugs used in the treatment of skin diseases and is today one of the most important agents employed by the dermatologist. The dermatologist is much concerned with keratin, which is the chief constituent of epidermal tissue. Keratin is peculiar in that it has a high sulphur content, the sulphur being present almost entirely in the form of the amino-acid cystine. No other protein is so high in cystine as the keratin of human hair. It would appear, therefore, that the metabolism of sulphur probably plays an important rôle in the development and growth of epidermal tissue. Attention is now being directed to a new sulphur preparation, one containing the sulphydryl group. Hammett, Reimann and their co-workers of the Research Institute of the Lankenau Hospital, Philadelphia, conducted studies to determine the chemical difference between the nucleus of a cell in mitosis and the nucleus of a cell in the resting condition. It was determined that, whatever other chemical differences there are, the most essential is a rearrangement of the sulphur in the molecules, so that this element appears in the chemical group sulphydryl and that this group is a stimulant to cell multiplication and that the partially oxidized derivatives thereof are retardative. Among several sulphydryl preparations studied by Reimann to stimulate wound healing, parathiocresol was selected. He observed that thioglucose favored bacterial growth and that thiophenol was too irritating. Drs. Brunsting and Simonsen have shown that cysteine may advantageously be employed. The advantage of this preparation is that it is less irritating than parathiocresol. Its disadvantages are that it is somewhat more expensive and it is more rapidly oxidized, forming cystine, which is inert. However, all sulphydryl-containing preparations probably undergo slow oxidation and must therefore be employed fresh. Caution should be exercised in not applying sulphydryl-containing preparations to malignant ulcerations and probably not to so-called premalignant lesions, since they may be stimulated to malignant change. In this category I would include ulcers, part of an x-ray dermatitis. For the same reason, prolonged application of sulphydryl-containing preparations to benign epithelial tumors, such as warts, papillomas and molluscum contagiosum, and chronic ulcers, particularly in a person of the cancer age, is, theoretically at least, contraindicated. Another use of sulphydryl preparations is to cause thickening of the skin over healed ulcers, burns and wounds. Reimann employed p-thio-cresol, not over 0.25 per cent in an anhydrous wool fat base. He advised its application three times a week until the desired result is obtained. Cysteine is probably too unstable for this purpose.

DR. JOHN H. STOKES, Philadelphia: I did not hear the entire paper, but I wish to commend the sulphydryl preparations in the treatment of bed sores. They are capable of transforming the misery to which these patients are subjected into comparative comfort. I have in mind particularly the spinal paralytic bed sores. A patient who had almost sloughed away his entire sacral area was relieved of pain and obtained a marvelous effect from it on the bed sores. The cheaper preparations, in spite of their bad odor in the mass, can be so handled by skilful packing and attention as to avoid this objection and the tendency to skin irritation likewise.

DR. M. F. ENGMAN, JR., St. Louis: Cysteine in small quantities is used in culture material. I have been attempting to grow a typical form of the bottle bacillus, which is very difficult, and after a great deal of trouble we obtained a few cultures in which I thought I had the bottle bacillus. There was never a pure culture but cysteine added to the medium improved the growth slightly, in what way I do not know. There is a definite metabolic action involved. Perhaps the primitive types of cells in general will improve when cysteine is in their vicinity and assists in their nourishment.

DR. LOUIS A. BRUNSTING, Rochester, Minn.: Dr. Klauder brought up the point of the possible stimulating effect of these preparations on new growths. In our series of over 200 cases, biopsies were made in all suspicious cases and all evidences of neoplasms were excised, and in some of these cysteine was used to promote the healing of the cauterized base. I will endorse the remarks of Dr. Stokes in regard to the value of these preparations in the treatment of decubitus, aside from the disadvantage of the use of wet dressings in the usually affected sites. The rate of healing was about the same under thiocresol or cysteine, although there was more apt to be irritation of the skin surrounding the ulcers under treatment by thiocresol than by cysteine.

The Basal Ganglia.—The basal ganglia comprise the following masses of gray matter: (1) optic thalamus; (2) lenticular nucleus; (3) caudate nucleus; (4) red nucleus. The lenticular nucleus and the caudate nucleus together form the corpus striatum. The first three are grouped around the internal capsule. The red nucleus is situated below the optic thalamus in the upper part of the midbrain. The lenticular nucleus is divided into an outer portion (the putamen) and an inner portion (the globus pallidus).—Steen, R. E.: A New View of the Function of the Corpus Striatum, *Irish J. M. Soc.*, June, 1931, p. 258.

FACIAL DIPLEGIA IN LYMPHATIC LEUKEMIA

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AND
JOHN S. LAWRENCE, M.D.
ROCHESTER, N. Y.

Bilateral paralysis of the facial nerves is rather uncommon. It is usually associated with infections of the nervous system, such as polyneuritis and gummatous basal meningitis. A leukemic origin of the disorder is extraordinary. In view of the infrequency of leukemia as a cause of facial diplegia, we have thought it worth while to report the clinical and pathologic observations in a patient who presented this picture. We have included in this report the clinical data in two other cases of acute leukemia in which a unilateral facial paralysis occurred.

REPORT OF CASES

CASE 1.—*Clinical History.*—L. M., a housewife, aged 46, was admitted to the Rochester Municipal Hospital, Feb. 3, 1932. She complained of paralysis of both sides of the face, loss of the sense of taste, headache, dizziness and nausea. Her present illness began on Jan. 6, 1932, with an attack of dizziness, which was followed by nausea and vomiting. The following day she complained of weakness and dizziness and was confined to bed for one week. During this time, she had a fever which ranged between 101 and 103 F. The paralysis of the right side of the face developed ten days before admission to the hospital and that of the left side two days before entry. Additional symptoms at the onset of the facial paralysis were severe throbbing headache, sore throat and tinnitus in the left ear. The past history was irrelevant.

Physical Examination.—She was well nourished and did not appear acutely ill. The temperature (rectal) was 38 C. (100.4 F.) and the pulse rate 100; respirations were 20. The blood pressure was 150 systolic and 90 diastolic. The skin and mucous membranes showed no evidence of anemia. The tonsils were enlarged and covered with a grayish-white exudate. Numerous small purpuric spots could be seen over the surface of the tonsils. The cervical glands were slightly enlarged and tender to palpation. Examination of the heart and lungs yielded negative results. The spleen and liver were not palpable.

Neurologic Examination.—The face was expressionless, owing to a bilateral facial paralysis of the peripheral type (fig. 1). The patient could not wrinkle the forehead, retract the corners of the mouth or completely close the eyes. The inability to move the lips resulted in some impairment of speech. The sense of taste was lost over the anterior two thirds of the tongue, but was well preserved over the posterior portion. The facial muscles on both sides failed to react to faradic current. There was some nystagmus on looking to the left. Hearing was slightly impaired on the left side. The cranial nerves were otherwise normal. Ophthalmoscopic examination gave negative results. A neurologic survey of the extremities revealed no abnormalities.

On admission the hemoglobin was 85 per cent (Sahli); the red blood cell count was 5,030,000 and the white blood cell count was 14,750 per cubic millimeter. The differential count showed: polymorphonuclear neutrophils, 70 per cent; lymphocytes, 25 per cent; monocytes, 3 per cent; eosinophils, 1 per cent, and basophils, 1 per cent. Platelets appeared in normal abundance. A lumbar puncture yielded a clear colorless spinal fluid under pressure of 190 mm. of water. The spinal fluid contained 3 cells per cubic millimeter, and the Pandy test was negative. The Wassermann tests of the blood and spinal fluid were negative. Culture of the throat for Klebs-Loeffler bacilli was negative. The urine was normal.

Clinical Course.—On February 12, or nine days after admission, the patient developed a slight fever. At the same time purpuric spots were noticed over the forearms. The white blood cell count on this date was 52,100 per cubic millimeter. A differential count at this time was: polymorphonuclear neutrophils, 19 per cent, and small lymphocytes, 73 per cent. The bleeding time was three and a half minutes. On February 16 the cervical glands were considerably larger, and a few glands could be felt in the left axilla and right inguinal region. Purpuric spots were widely distributed over the body. The spleen and the liver were not palpably enlarged. The facial paralysis remained unchanged. The hemoglobin and red blood cell count fell to 80 per cent and 4,670,000 respectively. The leukocyte count rose to 144,400 per cubic millimeter. A differential count with supravital neutral red technic showed: neutrophils, 10 per cent; myelocytes "B," 0.5 per cent; basophils, 1 per cent; eosinophils, 0.5 per cent; small lymphocytes, 81 per cent; intermediate lymphocytes, 4 per cent; monocytes, 1 per cent; degenerated forms, 2 per cent. Examination of two fixed stained smears revealed only 5 platelets. An oxydase differential count on 200 cells showed 7.5 per cent positive and 92.5 per cent negative. Bleeding time was eight and a half minutes. Two days later the patient began to bleed profusely from the nose. The glandular enlargement had increased. Albumin and red blood cells appeared in the urine. The neurologic signs remained unchanged. On February 25, a blood count showed 35 per cent hemoglobin, 2,080,000 red blood cells and 61,600 white blood cells per cubic millimeter. Death occurred on the following day, approximately seven weeks after the onset of the illness. Necropsy was obtained.

Gross Anatomy.—There were numerous purpuric spots in the skin of the trunk and extremities. The mucous membranes and serous surfaces of the thoracic and abdominal cavities also showed small hemorrhages. The right pleural and pericardial cavities each contained about 200 cc. of bloody fluid. There was generalized enlargement of the superficial and deep lymph glands. The spleen and the liver were not enlarged.

The meninges appeared normal except for many petechial hemorrhages in the pia-arachnoid over the convexity of the brain. The cranial nerves showed no macroscopic changes. The seventh and eighth nerves were traced through the petrous portion of the temporal bones, and no gross abnormality was found. On section the brain and spinal cord were normal.

Microscopic Anatomy.—Sections taken from representative areas of both hemispheres and stained with thionine and hematoxylin-eosin showed no structural alteration except for an occasional vessel with a small collection of lymphocytes in the perivascular space. In some areas infiltration with lymphoid cells occurred in both the cerebral meninges and the walls of the meningeal vessels. As a result of the accumulation of these cells in the walls of the vessels, there was weakening with consequent hemorrhage. Sections of the brain stem showed no evidence of infiltration or hemorrhages. The cells forming the nuclei of the seventh nerves showed marked structural alteration of the type which occurs following injury to a peripheral nerve. Many of the cells were smaller and stained poorly. The nucleus and Nissl granules had disappeared from many of the cells, and in others the nucleus was eccentrically placed (fig. 2). The third and seventh pairs of cranial nerves were unfortunately the only ones available for microscopic study. Sections taken from the seventh nerves showed diffuse infiltration with lymphoid elements (fig. 3). The cells were found between individual fibers especially in the peripheral portion. The perineural tissues were also heavily infiltrated with lymphoid cells and red blood cells. The cellular infiltration of the right facial nerve was more extensive than that of the left. Sections of the facial nerves stained by the Marchi method showed degeneration of the nerve fibers. This was likewise more pronounced in the right facial nerve. Leukemic infiltrations were also found in both oculomotor nerves. The spinal cord was normal except for a few minute hemorrhages. Marchi preparations showed no evidence of degeneration of the fiber tracts. The spinal meninges were also infiltrated with lymphocytes. A few of the spinal nerves showed small collections of lymphocytes in the perineural spaces. The walls of some of the meningeal vessels were infiltrated with lymphocytes.

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Read before the Section on Nervous and Mental Diseases at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 14, 1933.

Comment.—The clinical picture on admission suggested strongly follicular tonsillitis complicated by cranial nerve neuritis. The appearance of the tonsils at this time, however, was atypical, since numerous small purpuric areas were present. This should always suggest the possibility of a leukemic process. The fact that the blood picture at this time revealed nothing other than a neutrophilic leukocytosis made the diagnosis more difficult. Later when the blood took on the characteristics of lymphatic leukemia the diagnosis was readily established. It is of distinct interest that infiltration of the cranial nerves occurred at a period when there was no increase in the number of lymphocytes in the peripheral blood. This demonstrates that it is possible to have marked increases in the number of cells in localized areas of the body without having their numbers augmented in the peripheral blood.

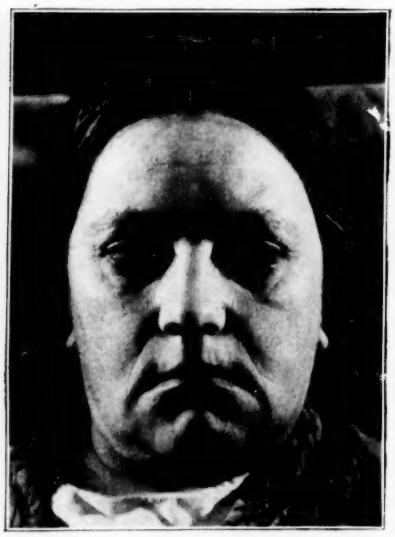

Fig. 1 (case 1).—Bilateral facial palsy showing the expressionless face.

CASE 2.—*Clinical History.*—J. B., a 65 year old, married farmer was first seen in the medical outpatient department, Dec. 8, 1932. He complained of pain in the right arm, double vision, dizziness and night sweats. The onset was in September, 1932, and was characterized by severe shooting pains in the left shoulder which radiated down the arm. These pains persisted for several weeks and were followed by pain of a similar type in the right arm. About two and a half months after the onset, he complained of double vision and a "staggering spell," during which he noticed a tendency to fall toward the right. The following day his wife noticed an internal strabismus in his left eye. There was no history of tinnitus or headache. Since the onset of his illness he has had frequent night sweats, weakness and loss of weight. The past history was irrelevent.

Examination.—The patient was well nourished and did not appear acutely ill. The temperature, pulse and respirations were normal. The general physical examination showed evidence of cardiac enlargement. The blood pressure was 160 systolic and 85 diastolic. There was no enlargement of the superficial lymph glands, liver or spleen. A large ecchymotic area was present in the skin of the right flank. The neurologic examination gave negative results except for paralysis of the left abducens nerve, which was unaccompanied by paralysis of conjugate deviation of the eyes. The blood count was as follows: hemoglobin, 82 per cent (Sahli); red blood cells, 4,350,000 per cubic millimeter; leukocytes, 15,300 per cubic millimeter; differential count, 37 per cent polymorphonuclear neutrophils, 2 per cent eosinophils, 57 per cent lymphocytes and 4 per cent monocytes. The smear showed definite diminution in the number of platelets. The urine contained a small amount of albumin. The Wassermann test of the blood was negative.

Course.—On December 13 he was again examined in the outpatient department. He complained of the same symptoms which were recorded at the time of his initial visit. During the intervening five days he developed some difficulty in eating. Examination on this date revealed a complete right facial paralysis of the peripheral type, left abducens paralysis and slight evidence of weakness of the right abducens nerve (fig. 4). He was admitted to the hospital for further study with a tentative diagnosis of lymphatic leukemia.

On admission, December 15, his physical status was unchanged, except for slight enlargement of the cervical and axillary glands. A few petechiae were observed on the soft palate. The white blood cell count rose from 20,000 on the day of admission to 48,000 on the day of discharge, nine days later. Supravital and fixed preparations (including oxydase stain) showed 92 per cent lymphocytes of the small and intermediate types. The spinal fluid contained 23 lymphocytes per cubic millimeter. The Wassermann test of the spinal fluid was negative. The blood sugar was 71 mg. per hundred cubic centimeters; the nonprotein nitrogen, 50 mg., and the blood uric acid, 6.6 mg. The basal metabolic rate was plus 74.

The diagnosis of lymphatic leukemia was established on the basis of the clinical and laboratory data. The patient received three high voltage roentgen treatments across the base of the skull and one over the spleen. On December 21 slight ptosis and limitation of inward movement of the left eye were present. The paralysis of the left sixth nerve and weakness of the right sixth nerve remained unchanged. The right facial paralysis showed no evidence of clearing. The patient was discharged from the hospital December 24, unimproved, and died at home ten days later. A communication from his wife stated that he did not develop paralysis of the left side of the face before death.

Comment.—The onset of the disease in this case was likewise characterized by a predominance of symptoms and signs referable to the nervous system. The cranial nerve palsies developed when the leukocyte count was relatively low and few symptoms of a constitutional disease were present. Studies of the blood in this case were helpful in arriving at an early diagnosis. It is impossible from the clinical observations in this patient to determine whether the cranial nerve palsies were the result of nuclear or peripheral nerve involvement. The absence of weakness or paralysis of conjugate deviation of the eyes suggests a peripheral location of the lesion.

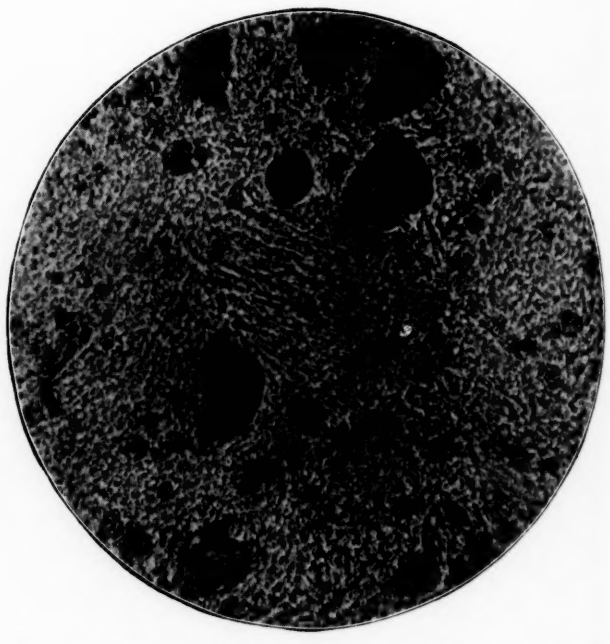

Fig. 2 (case 1).—Structural alteration of the cells of the left facial nucleus.

CASE 3.—*Clinical History.*—J. V., a 21 year old truck driver, was admitted to the Rochester Municipal Hospital in a critical condition. He complained of bleeding and weakness. His present illness began ten weeks prior to admission with a severe nosebleed. The following day there was a large bluish-purple discoloration over the right side of the face with marked edema and partial closure of the right eyelids. He was admitted to another hospital in the city on May 31, where he remained

six weeks. A diagnosis of lymphatic leukemia was made, and he received two blood transfusions and high voltage roentgen treatments over the neck and spleen. On his admission to that institution examination of the blood showed a marked secondary anemia, and the leukocytes numbered 109,000 per cubic millimeter. On July 5 he developed a paralysis of the right side of the face. The past history was irrelevant.

Fig. 3 (case 1).—Infiltration of the right facial nerve with lymphoid cells.

Physical Examination.—He was pale and emaciated. The temperature was 40 C. (104 F.) and the pulse rate 120; respirations were 30. He was mentally clear. The mucous membranes of the mouth showed many small hemorrhages, and there was marked inflammation of the gums. The cervical, axillary and inguinal glands were enlarged. The spleen was palpable. Examination of the heart and lungs gave negative results. The blood pressure was 110 systolic and 0 diastolic. The neurologic examination gave negative results except for a right facial paralysis of the peripheral type.

The blood count on admission showed a pronounced secondary anemia with 1,440,000 white blood cells per cubic millimeter. The predominant cells in the smear were lymphoblasts and lymphocytes. Platelets were decreased in number. Urinalysis and the Wassermann test of the blood gave negative results.

Course.—The patient's condition became progressively worse, and the white blood cell count fell to 4,500 per cubic millimeter on the day of his death, six days after admission. Autopsy was not obtained.

Comment.—This case differs somewhat from the two previously described in that the facial paralysis appeared six weeks after the clinical picture of leukemia was well established. Hemorrhagic phenomena in the skin and mucous membranes were prominent symptoms before the paralysis occurred. The nature of the lesion involving the seventh nerve was undetermined, but nevertheless it seems justifiable to attribute it to the changes found in the cranial nerves in cases of leukemia.

COMMENT

In 1926, Fried [1] reported the pathologic changes in the brain in a case of lymphatic leukemia and reviewed from the literature the neuropathologic observations in thirty cases. In seven of these cases there was involvement of the cranial nerves, and in four a bilateral facial paralysis occurred. In addition to those cases quoted by Fried similar cases have been reported by Moore,[2] Laroche and Chatelin,[3] Trömmer and Wohlwill,[4] Spangenberg [5] and Howell and Gough.[6] In the majority of these cases, in which pathologic examination was done, the leukemic changes were found in the nerves or their sheaths. The paralysis and ultimate degeneration of the nerves were ascribed to infiltration with lymphoid cells and hemorrhages. Howell and Gough have furnished an excellent example of cranial nerve paralysis due to nuclear involvement. Although they found slight leukemic infiltration of the nerve sheaths the chief pathologic changes were found in the nuclear regions and consisted of lymphomas, capillary thrombosis and perivascular accumulation of lymphocytes.

It is interesting to note that the cases in which facial diplegia occurred were all of the lymphatic type and, with one exception, were cases of acute leukemia. Cranial nerve palsies are much less frequent in the course of myelogenous leukemia. Trömmer and Wohlwill reported the case of a 46 year old laborer with severe trigeminal neuralgia, which was not relieved by the extraction of teeth. It was later discovered that he had myelogenous leukemia.

The frequency of involvement of the facial nerves is not surprising when one considers the anatomic circumstances which make the facial nerves particularly vulnerable. Slight edema of the facial nerve in its intracanalicular portion may result in considerable functional disturbance. In our first case the infiltration of the oculomotor nerves was almost as extensive as that found in the facial nerves, yet there was no evidence of dysfunction during life. Although the facial nerve is given special mention in individual case reports, it must be recognized that other cranial nerves may show the same histologic changes. It is a well established clinical fact that leukemia is a relatively common cause of that group of symptoms which is designated as Ménière's symptom complex. This syndrome is usually ascribed to hemorrhages in the labyrinth, but may be due to infiltration of the eighth nerves with lymphoid

Fig. 4 (case 2).—Right-sided facial paralysis on an attempt to close the eyes and retract the corners of the mouth.

1. Fried, B. M.: Leukemia and the Central Nervous System, Arch. Path. **2**: 23 (July) 1926.

2. Moore, F. C.: Lancet **1**: 525, 1902.
3. Laroche and Chatelin: Diplégia faciale periphérique au cours d'une leucémie lymphoïde, Rev. neurol. **19**: 642, 1911.
4. Trömmer and Wohlwill: Periphere Nervenkrankung bei Leukämie, Zentralbl. f. inn. Med. **28**: 996, 1927.
5. Spangenberg, J. J.: Leucemia linfógena aguda iniciación visceral poso frecuente presentando además una diplegia facial y la parálisis del motor ocular externo izguierdo, Presna méd. argent. **15**: 329, 1928.
6. Howell, A., and Gough, J.: Acute Lymphatic Leukemia with Facial Diplegia and Double Abducens Palsy, Lancet **1**: 724, 1932.

elements similar to that in the case described by Trömmer and Wohlwill.

While the number of clinical and pathologic observations on cranial nerve involvement in leukemia is small, we believe that if the cranial nerves were examined pathologically in all cases of leukemia the incidence of involvement would be much higher than is generally supposed. It is important, therefore, to consider the possibility of leukemia in all cases of unexplained cranial nerve paralyses, particularly in those cases in which there is clinical evidence of unilateral or bilateral paralysis of the seventh or eighth nerves.

If one bears in mind the possibility of leukemia as a cause of cranial nerve paralysis, it will be only the exceptional case that may offer difficulty in diagnosis. A facial diplegia of leukemic origin with perhaps some pains in the extremities, owing to infiltration of the spinal nerve roots, may be confused with that form of infectious polyneuritis in which a bilateral facial paralysis is a special feature. The presence of glandular enlargement, hemorrhagic phenomena in the skin and mucous membranes and leukemic blood changes should lead to the correct diagnosis. The same criteria are necessary in differentiating the condition from facial diplegia due to syphilis. In Howell and Gough's case the patient had a positive Wassermann test, but necropsy disclosed the leukemic nature of the paralysis.

SUMMARY

Patients suffering from leukemia, especially the acute type, may have paralysis of the cranial nerves owing to leukemic infiltrations and hemorrhages in the nerves or their nuclei. The facial nerves are frequently affected. In three cases of acute lymphatic leukemia reported, bilateral facial paralysis occurred in case 1 and unilateral facial paralysis in cases 2 and 3.

ABSTRACT OF DISCUSSION

DR. GEORGE B. HASSIN, Chicago: Drs. Garvey and Lawrence gave an excellent description of the peripheral nerve changes. They show infiltrative phenomena of perineuritis and endoneuritis combined with degenerative nerve changes ordinarily seen in peripheral neuritis. The infiltrations and the changes in the axons and myelin have no relationship; that is, the degenerative nerve changes are not caused by the infiltrations. The two are independent phenomena due to the same cause, an infection or, more probably, an intoxication. The ganglion cell changes of the seventh nerve demonstrated by the authors are secondary (axonal reaction).

DR. R. H. JAFFE, Chicago: In the modern literature on leukemia there is the tendency to consider it as belonging to the malignant tumors. I do not think, however, that this assumption is warranted, since fundamental differences exist between leukemia and malignant tumors. While in malignant tumors metastases develop from the primary tumor by the implantation of cells derived from the primary tumor, the leukemic infiltrations develop locally from the undifferentiated mesenchyma, which is widely distributed in the body and is found especially about the smaller blood vessels. Normally when irritated this undifferentiated mesenchyma gives rise to free histiocytes and probably also to lymphocytes and plasma cells. In leukemia there is a fundamental change in the reactivity of the mesenchyma in that even a slight, physiologic stimulation induces an abundant proliferation of the perivascular cells, which may differentiate into lymphoid or myeloid tissue. Thus the leukemic tissue develops locally and not by implantation from a primary focus. The organs most commonly affected by the leukemic cell proliferation are the bone marrow, spleen, lymph nodes, liver, lymphatic tissue of the digestive tract, and the kidneys. In some instances the proliferations are more generalized, involving also the heart, suprarenals, thyroid, lungs, skin, and other structures. It is interesting to see how the mesenchyma of the nervous system reacts in cases of leukemia and it seems to me that it does not differ from the mesenchyma of the other regions of the body. The presence of toxic changes in the brain in cases of acute leukemia supports my conception that there exist intimate relations between infection and leukemia. There is, perhaps, an inherited or acquired abnormal irritability of the mesenchyma, the leukemic tendency of which becomes manifest under the influence of a variety of toxic or infectious causes.

DR. TOM B. THROCKMORTON, Des Moines, Iowa: I should like to know how long there may be evidence of peripheral cranial nerve involvement before leukemic changes in the blood become manifest; or do the blood changes always precede the paralytic symptoms? I have in mind an instance of an isolated third nerve paralysis occurring in a middle aged man who otherwise seems to be perfectly healthy. No explanation, so far, has satisfactorily accounted for the cause of the paralysis. The presentation of this paper opens up a new possibility and I wonder whether it may be possible that my patient is manifesting the early evidence of leukemic paralysis before blood changes of the disease are evident, just as one often sees patients with a combined cord lesion due to pernicious anemia, in whom the blood changes are slight or entirely absent.

DR. JOHN L. GARVEY, Milwaukee: In answer to the last question, the first patient had a white count of 14,000 and there was no disturbance of the differential formula. One of the other cases I recall, a case of double abducens and double facial paralysis described by Spangenberg, presented a white count of 9,000. The differential count in this case revealed a lymphocytosis.

UNUSUAL EXPERIENCE WITH AMEBIC DYSENTERY

IN AN AVERAGE HOSPITAL OF A NORTHERN STATE, WITH REPORT OF NINE CASES ORIGINATING IN CHICAGO

KANO IKEDA, M.D.

ST. PAUL

The news of a serious outbreak of amebic dysentery in Chicago during the summer, contained in the press dispatch of Nov. 10, 1933, immediately confirmed the belief that all the five cases then presenting the disease, which had been recognized in this hospital during the preceding three weeks, had probably been contracted while the patients were visiting in that city. Not until the publication of the articles [1] on amebiasis dealing specifically with this outbreak, in the November 18 issue of THE JOURNAL, was the seriousness of the situation with its widespread danger affecting the whole nation fully appreciated. While my associates and I did not, from the onset of our experience, minimize the far reaching epidemiologic significance of amebiasis as a result of the suspected outbreak in Chicago, we were more impressed with the comparatively large number of cases we had been able to recognize during this short period, when apparently no other cases of amebic dysentery had been reported from this locality.

Indeed, so much interest had already been aroused that on November 7 we devoted the entire evening to the subject of amebiasis with autopsy report at our monthly staff meeting. It became clearly pertinent to

Read, in part, before the Ramsey County Medical Society, Nov. 29, 1933.

From the pathologic laboratory of the Charles T. Miller Hospital, Inc., and Amherst H. Wilder Dispensary, St. Paul, and the Department of Pathology, University of Minnesota Medical School, Minneapolis.

1. Bundesen, H. N.; Rawlings, I. D., and Fishbein, W. I.: The Health Hazard of Amebic Dysentery, J. A. M. A. **101**: 1636 (Nov. 18) 1933. Tonney, F. O.; Hoeft, G. L., and Spector, Bertha Kaplan: The Threat of Amebiasis in the Food Handler, ibid. **101**: 1638 (Nov. 18) 1933.

question whether some of the cases showing intestinal disorders, at least among those who had visited in Chicago during the summer, may not in reality have been cases of amebic dysentery which physicians failed to suspect or recognize. That such would seem to have been the fact has since been amply substantiated by reports from various parts of the country, notably the report by Lund and Ingham[2] in a recent issue of THE JOURNAL.

The Chicago epidemic, resulting in a nation-wide fresh dissemination of this infection, has awakened unusual interest among practicing physicians. The present report of nine cases that came under observation in the past six weeks, with some of the features unique in my experience, is deemed timely.

INCIDENCE IN MINNESOTA

While a number of articles have been written calling the attention of the profession to the relative frequency of this infection in the Northern states, only sixty-seven cases were reported to the Minnesota State Board of Health in the sixteen-year period ended Dec. 31, 1932, from civil practice, with thirty-two deaths, an incidence of four cases a year with a 50 per cent mortality; 476 other cases were recorded during the same period from the United States veterans' hospitals and 120 cases at the Mayo Clinic, among the out of state patients, from 1926 to 1932, inclusive. Only seven cases were reported from St. Paul from 1917 to 1927, all of which were fatal. No cases were reported from this city from 1928 to 1932, inclusive. Only ten cases were reported from Minneapolis from 1917 to 1932, inclusive. This would seem to indicate that physicians either fail to recognize this condition in many instances or neglect to report the occurrence to the health authorities, when diagnosed. That the endemic occurrence of this infection has been rare in Minnesota may be partly inferred from my own limited experience of the past fifteen years, representing, however, a fair cross section of hospital laboratory practice in the Twin Cities, in which only two or three cases (or less than 1 per cent of the stools examined for ova and parasites) of intestinal amebiasis, usually of the chronic or recurrent type, have been seen annually. This may be said to conform roughly to the experience of the Chicago Board of Health, with only eighteen cases of amebiasis a year since 1930.

It was therefore quite unusual to discover, rather unexpectedly, two cases of amebic dysentery within a period of a few days. As the source of infection in the first case had already been fairly definitely traced to Chicago, our suspicion in the second case was soon confirmed when the patient was found to have been a frequent visitor to Chicago during the summer. Chicago as a common source of amebic infection was now more than a probability, and it was freely predicted that more cases of dysentery would be found among those who had visited the world's fair. Our prediction was soon substantiated by finding three additional cases, all traceable to that city, within another ten days, making a total of five cases of amebic dysentery in less than twenty days, a unique experience in ordinary times in a private hospital of an average capacity in this part of the country. We have since diagnosed four more cases, making a total of nine cases in a period of approximately six weeks.

2. Lund, C. C., and Ingham, T. R.: Four Fatal Cases of Unsuspected Amebiasis: Preliminary Report on One Aspect of the Recent Chicago Epidemic, J. A. M. A. **101:** 1720 (Nov. 25) 1933.

In the face of a serious outbreak such as has occurred during the past four months, it may be estimated that out of those who actually become exposed to this infection, that is, out of those who ingested cysts of Endamoeba histolytica, a small number may entirely escape transmission; another equally small number may develop the symptoms of acute dysentery requiring immediate medical attention, and the remainder, representing fully more than 50 per cent, though infected, may probably show little or no clinical symptoms of dysentery or serious abdominal distress. It is this last group, constituting many thousands of Chicago visitors from all over the country during the summer months, that may become a great menace to public health, along with the clinical cases that are never diagnosed.

REPORT OF CASES

An analysis of these nine cases brings out several unique and atypical features, which may easily be confused with other intestinal disorders and may prove not only interesting but instructive in the differential diagnosis of this unfamiliar disease. The possibility of intestinal amebiasis among those who may consult the physician with vague abdominal distress or gastrointestinal upsets as well as with acute abdominal symptoms is once more emphasized, in the light of our experience with these nine cases. None of the patients, it should be noted, had ever experienced similar attacks before.

Fig. 1.—Appearance of colon in case 1, showing narrowing of the lumen, irregular outline (filling defect), induration of the wall involving the cecum and part of the ascending colon; there is apparent shortening or contraction of the involved area; also a wide open ileocecal valve.

CASE 1 (Drs. H. E. Hullsiek and C. N. Hensel).—C. B., a man, aged 59, a surgeon, on his way home from an extended vacation trip through the Pacific West, was forced to stop off at St. Paul on account of rectal discomfort. He was admitted to the hospital, October 13, as an outpatient, for proctoscopic examination and biopsy from a rectal lesion, which had been observed at the office of the attending physician. The patient gave a six weeks history of rectal discomfort, associated with periods of diarrhea. The first attack of diarrhea was experienced a day after his arrival at Yellowstone National Park from

Chicago, September 1, and was thought to be due to water and foods at the park. This lasted three days. The stools were clay colored and there was a trace of gross blood and mucus. This he attributed to straining at stool. September 8, he took a laxative, which made him feel much better. The stools appeared normal. There was a recurrence of diarrhea, September 11. This was associated with vague pains in the rectal

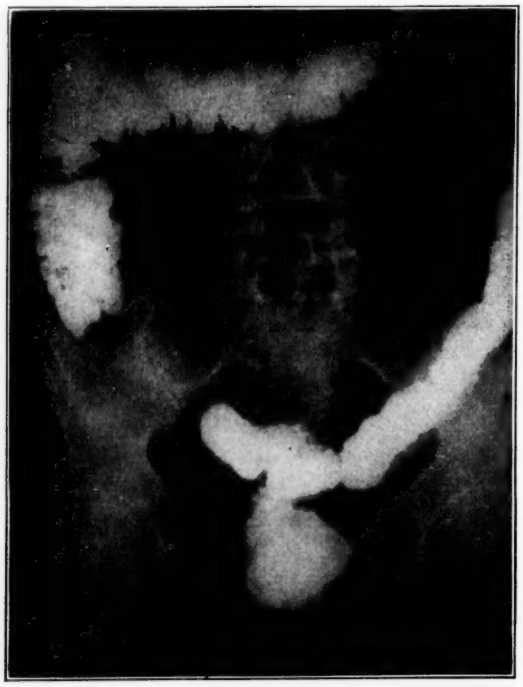

Fig. 2.—Appearance of colon in case 5, showing a similar appearance of the cecum, ascending portion and the terminal ileum; also small areas of filling defect in the transverse colon and sigmoid.

region and some shooting pains in the anal area, as of hemorrhoids. September 30, a rectal tube was passed for a high enema. This apparently traumatized the rectum. From this time on, the symptoms had become intensified. The stools were loose and contained blood and mucus. Although he experienced abdominal and rectal discomfort, had some fever from time to time and did not feel well at times, he continued on his scheduled trip, visiting California and the Pacific Northwest. He was on his way home to Philadelphia when he sought medical advice in St. Paul.

On admission, physical examination was essentially negative except for tenderness in the left lower quadrant to deep palpation. There was also a palpable mass—probably a distended cecum—in the right lower quadrant.

Proctoscopic examination revealed a small ulcer with a soft elevated edge in the rectosigmoid junction, which was apparently due to the trauma caused by the self-introduced rectal tube, two weeks before. Biopsy from the ulcer revealed an acute inflammatory lesion. Because of the vague palpable mass in the right lower quadrant, a roentgen examination of the colon was done. There was a diffuse irregular filling defect with induration of the wall, as though by an infiltrating growth, with a narrowing of the lumen and an apparent shortening or shrinking involving the cecum and ascending colon, without evident spasticity, fluoroscopically. This was interpreted to be a diffuse, chronic, nontuberculous inflammatory lesion or possibly an infiltrating tumor (fig. 1).

The patient was discharged on the same day. He was requested to bring in a specimen of feces, in view of the roentgen examination of the colon. This he did on the following day. The stool was soft, partly liquid and contained much mucus and some gross blood. Microscopically, sluggishly motile amebas in large numbers and a few cysts characteristic of Endamoeba histolytica were found. The following morning a sample of fresh stool was obtained, which revealed many actively motile endamebas morphologically characteristic of the histolytica type. Bacteriologic examination of the feces was negative for the organisms of the typhoid and dysentery groups. The Widal and other agglutination reactions were negative.

The patient was hospitalized, October 18. His temperature rose to 100 F. on the second day. Urinalysis was negative. The blood showed: hemoglobin, 71; erythrocytes, 4,110,000; leukocytes, 6,200 with 69 per cent neutrophils. A course of emetine injections was given and the patient was discharged, October 30, considerably improved. The boggy mass in the right lower quadrant gradually disappeared. The stools showed a few cysts from time to time but otherwise became normal in consistency and appearance.

While the patient himself was, at first, strongly of the opinion that the condition was due to water and foods at Yellowstone National Park, the fact that he spent eight days in Chicago before he proceeded toward the west pointed strongly to that city as a probable source of infection. While in Chicago, he stopped at Hotel C. but ate most of his meals at Restaurant H. on M. Avenue. He ate one breakfast and a dinner at the hotel and a sandwich at the fair. The incubation period in this case is estimated to be from seven to fifteen days.

This case is of particular interest because of the rectal ulcer, which prompted a biopsy, and of the peculiar infiltrating type of a lesion in the cecum and ascending colon, which doubtless was due to the amebic infection. We were not prepared to make a diagnosis of amebic colitis from the roentgenograms, although in the light of our subsequent experience we believe that the roentgen finding of this disease is fairly typical and may be of aid in diagnosis.

CASE 2 (Dr. A. R. Hall).—**T. A. P.**, a man, aged 52, an insurance executive, was admitted to the hospital, October 19, complaining of diarrhea, tenderness and gas in the intestine, with a temperature of 101. The onset came with sore throat, soreness and stiffness of the neck, general malaise and weakness about a week before admission. The patient believed that he had not been feeling well since about the middle of July, when, while in his summer cottage, he had a first attack of

Fig. 3.—Low power view of the lesion in the rectum, obtained by biopsy, showing a deep mucosal creta with submucosal space filled with mucous exudate, containing only a few scattered inflammatory cells.

diarrhea and "stomach symptoms" in light form. During a visit to Chicago, September 16-18, he suffered a terrific abdominal cramp with diarrhea which lasted two or three days. On admission there was a diffuse abdominal tenderness. The liver was enlarged and palpable. He was nauseated and vomited several times. He appeared acutely ill. The leukocyte count was 22,000 and the temperature rose to 103. The first stool

was semiliquid and contained mucus, some gross blood and pus. There were many motile amebas morphologically characteristic of Endamoeba histolytica.

The patient had a stormy course for a few days with the temperature remaining up around 103. Roentgenologically, the liver was definitely enlarged but the diaphragm was not fixed. The temperature came down to the normal on the fifth day after the institution of the emetine therapy. The stools became normal in consistency and appearance within a few days. The amebas disappeared on the third day. The liver decreased in size, gradually to normal, with improvement. The patient was discharged after two weeks of hospitalization.

Fig. 4.—High power view taken from the same section as figure 3 of an area in the mucous mass in the submucosa, showing nests of amebic bodies and few inflammatory cells. Note apparent division of ameba.

The patient had been a frequent visitor in Chicago since March, 1933. In all he visited eight times between March 23 and October 18, staying at various hotels, including Hotels P., E., M. and C. He stopped at Hotel C., September 16-18, with his family. His meals were eaten at these hotels usually but also at the fair and at several restaurants, including Restaurant H. The patient traced his present trouble definitely back to his first attack in July, which was mild compared with the attack in September while a guest at Hotel C. The probable source of infection in this case is difficult to determine, since he had the first attack presumably in July. Whether the earlier attacks may have been due to dietary indiscretion is a justifiable conjecture, since the patient had a gastro-enterostomy for a duodenal ulcer in 1925, followed by a gastric resection because of a gastrojejunal ulcer the following year. If this proves correct, the source may be traced to Hotel C., in which event the incubation period for this case may be estimated to be between twenty-four and twenty-six days.

The case is of interest when considered in connection with case 6, the patient being one of his daughters. The case is of further interest since the clinical symptoms were so intense in the beginning as to arouse in the mind of the clinician a doubt as to whether this was a simple, uncomplicated case of acute amebic dysentery. The cultural studies of the stools were negative.

CASE 3 (Dr. E. T. Herrmann).—P. B., a man, aged 45, an attorney, was admitted to the hospital, November 2, complaining of general pain and discomfort in the abdomen with explosive movements and diarrhea, mucus and blood in the stools. There was a rise in temperature. The abdomen was distended and tender over the lower portion. The liver and spleen were not palpable. The present complaints began a day before admission. The first sample of feces contained much mucus and gross blood and showed many actively motile amebas, morphologically considered Endamoeba histolytica. On admission, the temperature was 102; the leukocyte count, 22,500. The temperature was normal on the fourth day and the leukocyte count 9,400 a week after admission.

Under the specific therapy, he has been progressing satisfactorily. No amebas or cysts have been found since his stools returned to normal on the fourth day.

The patient was in Chicago, September 14-16, remaining at Club C. He returned there on the following week, September 21-22, and stayed at Hotel S. He took most of his meals at the club and the hotel but ate once at Restaurant H. and once on the fair grounds. He remembered eating a sandwich with a glass of beer at Hotel C. The incubation period is estimated to be between fifteen and seventeen days.

CASE 4 (Dr. E. T. F. Richards).—M. O., a woman, aged 41, a housewife, was admitted to the hospital, November 7, complaining of severe abdominal cramps and marked diarrhea. The present illness began about October 20, when she had cramps in the abdomen and bearing down and pulling pains, with much gas in the intestine and frequent movements but no diarrhea at first. There was a general discomfort and malaise and a rise in temperature. About a week after the onset she developed a marked diarrhea, which continued and became very severe. She lost her desire or taste for food. The stools were liquid, expelled explosively and contained blood and mucous grossly. Endamoeba histolytica was found in large numbers. There were seven and nine stools in the first two days following her admission. The patient was acutely ill and appeared very toxic. The temperature was from 100.6 to 102.4, with a pulse rate of from 120 to 144 per minute during the first few days. The leukocyte count on admission was 19,450, with 88 per cent polymorphonuclears. The temperature came down to normal on the eighth day after the institution of the specific therapy. Her improvement was slow at first but she is now well on the way to recovery. The stools have been normal since the fifth day, and no amebas or cysts have been found since the third day.

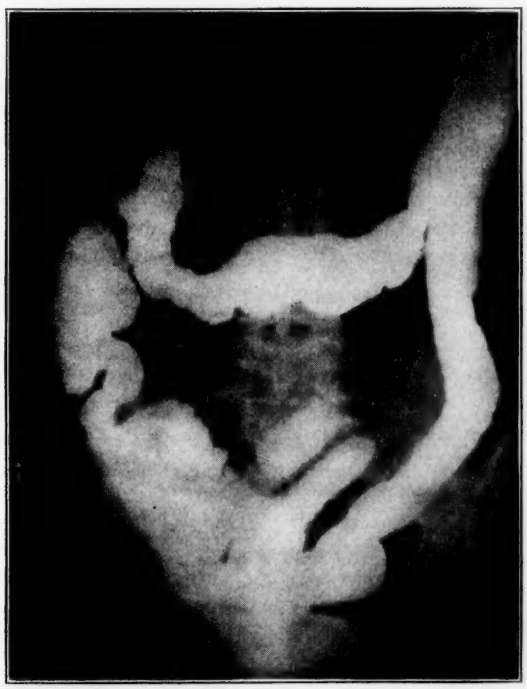

Fig. 5.—Appearance of colon in case 7, portraying more advanced changes in the cecum, ascending colon and involvement of the transverse portion; the ileocecal valve is widely patent.

The patient visited Chicago, September 24, and remained until the 27th. She stopped at Hotel C. and ate her meals there mostly. She visited the city two months before. No data are obtainable regarding this visit. The incubation period is calculated to be between twenty-three and twenty-six days.

It was noted that her stools, unlike those from other patients, were watery, mixed with streaks of thin mucus and dark brownish red. The mucus was not thick, glairy and semitransparent as in the typical case. Microscopically there were many pus cells and macrophages as well as fresh red blood cells. While no dysentery bacilli were isolated and the Widal test was negative, it is assumed that there was a mixed bacterial infection to cause this type of stools, which might also account for her extreme toxic state.

CASE 5 (Dr. H. E. Hullsiek).—H. J. C., a man, aged 51, an industrial director, was first admitted to the hospital, October 13, for the purpose of proctoscopic examination and biopsy.

Fig. 6.—Sigmoid from a case of systemic amebiasis showing a small infected diverticulum—the only primary lesion in the colon.

He first noticed abdominal cramps, gas, tenderness and diarrhea, August, 15. He complained of a poor appetite and had a general feeling of malaise. Though not acutely ill, he was feeling "rotten" and suffered from a vague abdominal distress most of the time, with occasional recurrence of cramps and diarrhea. He had much tenesmus and a frequent desire to evacuate, without results. He consulted a physician, September 10, and underwent a general physical examination and a roentgen examination of the colon. These examinations were essentially negative except for a fissure of the anus, for which he was given suppositories. A month later, October 10, he consulted the present physician, who on proctoscopic examination found an area of peculiar diffuse induration involving the wall of the rectum, quite suggestive of a malignant growth, and a marked fibrous stricture of the anus. On admission, two small pieces were removed through the proctoscope for rapid diagnosis. A frozen section of the specimen merely showed a chronic inflammation of the rectal mucosa. The surgeon was not satisfied with the diagnosis and arranged for a second biopsy later and discharged the patient. He returned to his work, but the abdominal cramps were so severe that morphine was often required to relieve the pain. For several days following the biopsy, he had watery diarrhea as many as fourteen times in one day. (The history was obtained later).

The patient was readmitted eighteen days later, October 31, for a second proctoscopic examination and biopsy. This again proved negative for a malignant growth. Eight days later, and only a few hours before he was to be discharged a stool specimen was submitted for examination. It was soft, partly formed and partly liquid and contained much free mucus and gross blood. Endamoeba histolytica was at once demonstrated in large numbers and actively motile. His discharge was canceled and he was immediately put on the specific therapy.

The patient had no elevation of temperature and there was no increase in leukocytes, and apparently he was not acutely ill while in the hospital. He steadily improved and was discharged, November 16, after a course of treatment. The stools became mushy and bulky but were never free of cysts and occasionally showed sluggishly motile amebas in small numbers up to the day of discharge. A roentgen study of the colon at this time revealed changes in the cecum and ascending colon not unlike those found in other cases. The transverse colon and the rectosigmoid area also showed small, irregular filling defects, due probably to superficial ulceration as well as to local spasm (fig. 2).

The patient visited most of the larger cities of the East and Middle West during the past year. He was in Chicago three times, from June 19 to June 23, September 15 and 16 and October 3 and 4. Since his abdominal symptoms began in the middle of August, the infection probably occurred during his first visit, which makes the incubation period from fifty-three to fifty-seven days. He stayed at Hotel A. during all these visits, except one night at Hotel E. He ate his meals at the hotel as a rule but also ate at various restaurants, including Hotel C., Club I. and Restaurant T., but never at the fair.

Serial sections of the second biopsy tissue from the rectal mucosa revealed an early typical amebic lesion, filled with a nonpurulent mucous exudate containing nests of amebic bodies. This was recognized following a discovery of Endamoeba histolytica in the stools (figs. 3 and 4).

CASE 6 (Dr. W. R. Shannon).—R. P., a girl, aged 10 years, student, a daughter of patient 2, was admitted to the hospital, November 13, following a telephone conversation between her mother and the school nurse, who reported that the child was crying, with severe abdominal cramps. The mother at the time was with her husband, patient 2, who came up to the laboratory for examination of the stool. The mother was advised of the possibility of her daughter's condition being due to amebic dysentery and requested to submit the stools for examination. The parents brought the child to the hospital directly from the school and the stool was examined at once. The stool was copious in amount, soft, mushy and partly liquid. It contained much mucus but no gross blood. Microscopically there were many vegetative and precystic forms and a few cysts typical of Endamoeba histolytica. The child showed a distended abdomen with much gas and complained of pain and distress diffusely over the lower portion, causing her to double up. The temperature was normal. The leukocyte count was 15,400, with 87 per cent polymorphonuclears.

The child had a terrific reaction to a first dose of one-eighth grain (0.008 Gm.) of emetine hydrochloride, subcutaneously, but has since tolerated a regular course of injections and is now on her way to recovery. The stools became soft and mushy and at times formed and no longer show either the vegetative or the encysted form of Endamoeba histolytica.

The child, with the rest of the family, visited the fair at Chicago, stopping at Hotel C. from September 16 to September 18. Most of the meals were taken at the

fair, but all the breakfasts and one or two other meals were eaten at the hotel.

The question as to when and how this child became infected is of interest. If her father, patient 2, had already been infected when the family registered at Hotel C., September 16, it would be practically impossible to determine the origin of her infection, since there is every possibility of her father transmitting the disease to her. On the other hand, if her father had not become infected until his stop at Hotel C., it would be easy to trace the origin of her infection to the same hotel. Transmission of this disease from one member of the family to another is easily conceivable. Assuming that her infection was contracted at Hotel C., the incubation period is estimated to be from fifty-six to fifty-eight days.

CASE 7 (Dr. J. E. Holt).—M. M. F., a woman, aged 53, a housewife, was admitted to the hospital, November 21, complaining of vague abdominal distress with diarrhea, which had been present, more or less, during the past four months. July 18, while staying at Hotel P. in Chicago, the patient was seized with severe pain in the abdomen. She was seen by the hotel physician, who treated her symptomatically. There was much gas in the bowels but little diarrhea. She had a slight rise in temperature and some anorexia. She returned home, July 22. Her condition had not improved. Three days after her return, she consulted a physician. She had a temperature of 102. A diagnosis of "colitis" was made and she was admitted to a local hospital in the first part of August. Her complaints remained the same. She had spells of diarrhea, gas in the bowels and abdominal pains and distress. The temperature ranged from 99 to 101. The stools were examined and reported negative for amebas, as were the various agglutination tests on the blood. She was given a course of treatment, including medicated enemas. Since discharge from the hospital, her condition had remained essentially the same.

When admitted to this hospital, she was quite weak and complained of abdominal distress. The temperature was 101 and the leukocyte count 9,000. A specimen of feces was obtained two days after admission. It was semiliquid and mixed with mucus but showed no gross blood. After a long search, two or three actively motile amebas, morphologically characteristic of Endamoeba histolytica, were found. None of them, however, showed any ingested red blood cells. In view of the history, which elicited her earlier visit to Chicago from July 4 to July 9, when she was registered at Hotel C., and of the subsequent course of her illness, it was felt justifiable to make a tentative diagnosis of amebic dysentery, in order to institute a proper measure of therapy. The roentgenograms of the colon, too, revealed a characteristic deformity of the cecum and ascending colon, which had been demonstrated in other cases of this series (fig. 5). Three days later the leukocyte count was 6,250, with 64 per cent neutrophils, including 14 per cent band forms.

The patient visited Chicago, July 4, and stopped at Hotel C. until July 9. She ate at the hotel and at the fair and at various restaurants, including Restaurant H. Her subsequent visit to Chicago occurred on July 15. She stopped at Hotel P. and became ill while there. This gives an incubation period from nine to fourteen days.

Emphasis may be made of the extreme difficulty in examining the stools for Endamoeba histolytica from patients chronically ill with this disease in whom other therapy, including local treatment, has already been given. A long and painstaking search is imperative. Yet there is every likelihood of missing the diagnosis.

CASE 8 (Dr. J. N. Gehlen).—F. B., a woman, aged 30, housewife, was referred to the laboratory for examination of the stools. She was not particularly ill at this time but had noted, of late, an increase in the number of stools, from once to four or five times a day. The stools were loose, as a rule but never at any time diarrheal. They contained a small amount of mucus and gross blood at each passage. This was first noted, November 3. She noticed acute abdominal cramps, in mild form, previous to movements once or twice, shortly after the onset. The specimen was represented by a few well formed, hard, small masses coated partly with a thick, glairy mucus and gross blood and several chunks of thick, clear, gelatinous mucus streaked with fresh blood. Endamoeba histolytica was present in typical form and large numbers, actively motile and ingesting red blood cells.

The patient was in Chicago, stopping at Hotel A. from October 1 to October 5. She ate most of her meals at Hotel C. Her present symptoms began, November 3. The incubation period was therefore between twenty-nine and thirty-three days.

This patient represents the majority of ameba-infested individuals, in whom the symptoms are so negligible that under ordinary circumstances no medical advice may be sought by the victim.

CASE 9 (Dr. Max Hoffman).—E. H., a woman, aged 38, housewife, was admitted to the hospital, November 30, because of a slight diarrhea of a week's standing. There was no appreciable abdominal distress and no rise in temperature. A few days before admission, her attention was called to a radio talk on amebic dysentery in Chicago and also to an instance in which death presumably occurred from this condition. The stools were semiliquid and contained much mucus and a small amount of gross blood. There were many dead, vacuolated amebas, few sluggishly motile and one or two containing fresh red cells. Amebic dysentery was tentatively diagnosed and saline catharsis was ordered to obtain specimens from the cecum and high up. Many actively motile amebas characteristic of Endamoeba histolytica were demonstrated in the subsequent specimens.

The patient was in Chicago from September 8 to September 11. She and her husband stayed at a private home while visiting the fair. They ate two breakfasts at the home, one at the M. F. Restaurant and the remaining meals at the fair. She had been perfectly well until the onset of the present illness, which occurred, November 24, while on a hunting trip in the Northern woods. She had moderate diarrhea. This she attributed to the strenuous walk and chilling incident to hunting. There were no abdominal cramps or distress. The incubation period was from seventy-four to seventy-seven days in this case.

This is the only case of the series in which the hotels in the loop district of Chicago are not involved as the source of infection, which may be traced to the concessions on the fair grounds, the private home or a downtown restaurant. This is an example of an early case in which the lesion was apparently limited to the cecum, in which typical motile amebas were demonstrable only in stools obtained by catharsis. The roentgen examination of the colon in this case revealed only a slight degree of spasticity at the cecum and along the sigmoid and no appreciable amount of induration, shortening or filling defect such as observed in other cases of this series, indicating apparently an early stage of the disease.

SUMMARY AND COMMENT

1. Case 1 was diagnosed and the source of infection fairly definitely traced to Chicago, one month before the public announcement of the outbreak in that city by the Associated Press, November 10. Within twenty days five cases of amebic dysentery were diagnosed, and within a space of forty-seven days a total of nine cases, all traceable to Chicago, were recognized through this laboratory, a unique experience for one hospital of an average capacity in this part of the United States.

2. Clinically, cases 1 and 5 are of unusual interest because of their presenting symptoms and of the manner in which they were treated and diagnosed. Amebic proctitis may be confused with an infiltrating type of a growth, while amebic colitis of the cecum and ascending portion of the colon may be mistaken for a tumor or inflammatory mass requiring surgical intervention.

3. Case 6 illustrates the fact that the onset of the disease may be of dramatic suddenness without any apparent prodromal signs. An acute surgical condition of the abdomen may easily be considered, especially in children.

4. Case 7 represents a large group of neglected and mistreated patients in which the diagnosis is missed and the condition treated as "colitis" without specific therapy. Cases such as this may furnish many a difficult and embarrassing moment to the pathologist on whom the final diagnosis must rest, probably because of the altered intestinal flora occasioned by local medication.

5. Cases 8 and 9 are examples from another large group, representing those innocent carriers who show no appreciable signs or symptoms of intestinal disorders and therefore ordinarily do not consult a physician. They constitute a dangerous group in which lies a continued danger to public health.

6. Cases 2, 3 and 4 illustrate a typical clinical picture of acute amebic dysentery in different degree of severity. Case 2 may be properly considered as a recurrent, acute type from the history and manner of onset. The patient was quite toxic and showed a definite enlargement of the liver. Patient 4 was extremely toxic and showed a fulminating clinical picture. Her stools suggested a mixed infection in the colon. Case 3 presented a typical case of less severe type in which the condition was recognized and the treatment instituted immediately.

7. The approximate incubation period varied from seven to fifteen days to from seventy-four to seventy-seven days. More interesting was the number of days between the probable day of onset and the day of diagnosis. This varied from one day and two days to 125 days. In cases 1, 5 and 7 the diagnosis was not made when first seen by the physician. It was three days in case 1, sixty days in case 5, and 119 days in case 7 after the first visit to the physician that the diagnosis was definitely established. In cases 5 and 7, the original physician was no longer in attendance when the diagnosis was made. In cases 1, 2, 5 and 6 the discovery of Endamoeba histolytica by the laboratory was a distinct surprise to the attending physician; in others the condition was more or less suspected clinically, owing probably to the wide discussion of the cases already discovered in the hospital (and not due to the newspaper publicity). Patient 9 sought medical advice through a radio talk.

8. The physical appearance of the first stool was more or less characteristic; mucus and gross blood were prominently visible in six instances. In case 6 it was mushy and bulky and contained much mucus but no gross blood. In case 7 it was semiliquid and mixed with mucus but showed no gross blood. The variation in the character of the stools may be accounted for by the chronicity of the infection and the type of local treatment, which may change the physical and chemical nature of the fecal flora.

9. Laboratory diagnosis in each instance was made on the first specimen of stool with little difficulty. In case 7 it was necessary to make a prolonged search before the few organisms were partly identified. They might well have been missed under ordinary circumstances. The cysts of Endamoeba histolytica were found in three cases; in the first stool in cases 1 and 6, and after the institution of treatment in case 5. The disappearance in every case of motile amebas is sudden and dramatic within the first few days after emetine treatment is begun.

10. The origin of this infection, traced to Chicago, may not be confined to one or two hotels and restaurants, as generally believed. It is probable that a few other hotels and eating establishments and perhaps some central meat, vegetable and fruit supply houses may also be involved. It is not probable that eating concessions at the fair were a source, since all fair employees were given an examination before they were hired.

11. Another interesting feature of this series is the observation that nearly all the victims are the members of the higher social circle, whose hygienic habits are of the best.

12. During this period of six weeks, we have examined a large number of stools from twelve or more patients who had diarrhea of from a mild to severe degree with negative results. In at least one or two of them we may have missed the amebas or their cysts. Two members of the family of patient 3 showed the stools infested with Endamoeba coli.

SYMPTOMATOLOGY

The individual resistance and the character of the intestinal flora probably play an important part in the duration of the incubation period and the manner of onset in amebic infection in man. The incubation period in man is variously estimated at from five to 100 days. The usual prodromal signs of infection may often be so insignificant as to escape notice or may be entirely absent. The onset may be sudden, as in acute "surgical abdomen," for which operative measures have been considered. It may be insidious and indefinite. The presenting symptoms usually consist of abdominal discomfort in the form of severe cramps or gaseous distention and general soreness or a localized tenderness over the cecal area, with or without diarrhea or frequent desire to evacuate. Diarrhea, with the passage of mucus and blood, may be the most prominent initial feature, or it may be secondary or absent. Pains and tenesmus in the rectum may often be troublesome. The symptoms may soon disappear and be forgotten. One or several recurrences of the symptoms, often in more severe form, may induce the patient to seek medical advice. There are doubtless many who consider the incident as an instance of "indigestion" or temporary bowel trouble attributable to dietary indiscretion and who fail to consult the physician. A few of the acute cases may develop severe, toxic symptoms with a high fever and an increased leukocyte count and a high percentage of young neutrophils ("band" form). Practically all cases, regardless of the degree of severity of the symptoms, readily respond to the specific therapy, as is shown by the rapid clinical improvement and disappearance of gross blood and amebas from the stools, as shown in the accompanying table.

LABORATORY DIAGNOSIS

The identification of Endamoeba histolytica is not always as simple as is generally believed. The character

of the stools in amebic dysentery may vary considerably. They may be liquid, soft and mushy or formed. Liquid, semiliquid or soft stools are the rule. A single amount is usually small. The most prominent feature is the conspicuous presence of mucus and gross, fresh blood. Often a sample of stool may be represented entirely by a small quantity of mucus and blood. The mucus is thick, glairy, transparent and usually unmixed with pus. It is not dull and membranous as in mucous colitis. The presence of pus usually indicates secondary infection or other coexisting acute inflammation and is not a cardinal feature.

Endamoeba histolytica is searched for in a small drop of the mucus mixed thoroughly in warm saline solution, first under the lower power objective. The following criteria are considered essential in the identification of Endamoeba histolytica under the high power lens: 1. The motility is active and progressive, extremely so under favorable conditions. 2. The pseudopodia are clear, transparent, tongue-like or finger-like and often well demarcated from the endoplasm. 3. The endoplasm (cytoplasm) is finely granular, ground-glass like and, when fresh, contains no bacteria, food particles, vacuoles and the like and usually shows no clear outline of the nucleus. 4. The amebas ingest fresh red blood cells. 5. The typical four nucleated cysts should be demonstrated. The cysts are not observed as a rule during the acute stage, and therefore the diagnosis may have to be made without their demonstration in the majority of cases. The amebas ingesting fresh red blood cells are practically always demonstrated in acute cases, but in chronic or mistreated cases it may be practically impossible to find them. On standing, the amebas may undergo changes which may allow the formation of vacuoles or, occasionally, the invasion of bacteria and may cause the nucleus to appear more distinctly. All these possibilities must be borne in mind, since the specimens of feces submitted are not always typical or as desired, nor are the typical specimens obtainable.

While, therefore, I follow the teaching of the authorities that the finding of red blood cells within the vegetative form of amebas and the demonstration of the four nucleated cysts should constitute the final diagnostic criteria of Endamoeba histolytica, I feel that, in experienced hands, a positive diagnosis, without either of the two, may be justified, at least in the face of an outbreak such as has been witnessed. Thus, when the lesion is confined in the cecum alone, as is often the case during an early stage of the disease, the amebas may undergo changes during the passage through the remaining colon and not be found alive on reaching the rectum. One with experience may recognize them and order immediate catharsis to confirm the diagnosis.

In the absence of diarrhea or of gross blood and mucus, the stools should be examined particularly for the encysted form. A saline purgative should then be

Observations in Nine Cases of Amebic Dysentery

Case	1	2	3†	4	5	6‡	7§	8	9
Name	C. B.	T. P.	P. B.	K. O.	H. C.	R. P.	M. M.	F. B.	E. H.
Sex	♂	♂	♂	♀	♂	♀	♀	♀	♀
Age	59	52	45	41	51	10	53	30	38
Days in hospital	10/13 (outpatient) 10/18-30	10/19-11/5	11/2-11/26	11/7-	10/12-17 10/31-11/16	11/13-28	11/21-	11/23 (outpatient)	11/30-
Visits to Chicago hotels and dates	H. C. 8/16-24	Rest. H. 3/23 H. P. 3/28-30 H. P. 4/6-8 H. E. 5/4-5 H. M. 5/6 H. E. 5/31-6/5 H. P. 6/8 H. C. 9/16-18 H. E. 10/11-18	C. C. 10/14-16 H. St. 10/21-22	H. C. 9/24-27 H. E. 2 mos. before	H. A. 6/19-23 9/15-16 10/3-4	H. C. 9/16-18	H. C. 7/4-9 H. P. 7/15-22	H. A. 10/1-5	Private home 9/8-11
Meals at	H. C. Restaurant H. Fair (1)	Restaurants Hotels, Fair (2)	C. C. Restaurants Fair H. C. (1)	H. C. Fair ?	H. A. Restaurants	H. C. Fair	H. C. and P. Restaurants Rest. H. Fair	H. C. mostly	Fair (mostly) Home (2) Rest. (1)
Onset	9/1	7/15 ? 10/12 ?	11/1	10/20	8/15	11/13	7-18	11/3	11/24
Probable incubation	7-15 days	24-26 days ?	15-17 days	23-26 days	53-57 days	56-58 days	9-14 days	29-33 days	74-77 days
Diagnosis made on	45th day	7th or 92d day	2d day	18th day	85th day	1st day	125th day	20th day	6th day
Diagnosis made by physician on	3d day*	?	1st day	?	60th day*	1st day	119th day*	1st day	1st day
Stage	Subacute	Acute, recurrent	Acute	Acute	Subacute	Acute	Chronic	Mild subacute	Mild acute
Symptoms on admission	Rectal (biopsy); mild abdominal	Abdominal, toxic enlarged liver	Diarrheal, abdominal	Abdominal, toxic, diarrheal	Rectal (biopsy); abdominal	Abdominal	Abdominal distress	Increased stools; no diarrhea	Diarrhea (only)
Temperature	100	103	102	102.4	98.6	98	101	Normal ?	99.8
White blood cells	6,200	22,000	22,500	19,450	7,300	15,400	9,000	?	6,600
First stools	Semiformed; mushy; mucus; G. blood	Semiliquid; pus; mucus; G. blood	Semiliquid; mucus; G. blood	Watery; mucus; G. blood	Soft; mucus; G. blood	Bulky; mushy; mucus	Semiliquid; mucoid	Formed; mucus; G. blood	Semiliquid; mucus; G. blood
E. histolytica¶	Many	Many	Many	Many	Many	Many	Scarce	Many	Many
Cysts	+	.....	.....	.....	+	+	.....	.....	.....
Laboratory diagnosis	At once	At once	At once	At once	At once	At once	One day	At once	At once
Stool on discharge	Cysts	Negative	Negative	Negative	Cysts	Negative	?	?	?

* Acute attacks before admission.
† Wife and daughter show Endamoeba coli in stools.
‡ Daughter of patient 2. Mother showed Endamoeba coli.
§ Her husband at Hotel C. with her, 7/4-9; died of multiple penetrating jejunal ulcers, 10/26. No amebas demonstrated in the lesion, to date.
¶ Amebas with ingested fresh red blood cells demonstrated in every case.

given to obtain a liquid passage. No final negative report should be given until at least three samples have been carefully examined.

A danger of a false positive report by the inexperienced is increasingly evident, especially in a sudden outbreak such as this, when technicians and clinical pathologists of limited experience on medical protozoology are called on to examine the stools from suspected individuals. Their negative report may be equally dangerous. It is evident that those who engage in the practice of laboratory medicine must be fully prepared to meet the situation, in the future. The present outbreak has afforded some of us the opportunity of further study on this particular type of intestinal protozoa.

An attempt to cultivate the amebas on artificial mediums has not been as successful as anticipated. The best that could be accomplished was the apparent prolongation of the life and active motility of the amebas for a period of forty-eight hours, Locke-egg-serum medium and liver infusion agar medium being used. Transplants were only partially successful.

A possibility of the routine use of the complement fixation test in amebiasis strongly suggests itself at this time. Such an attempt should be made in these as well as in other cases. The experimental work has already been successfully carried out by Craig,[3] Sherwood [4] and others and has introduced a promising field in laboratory diagnosis of this disease.

According to Craig,[5] Dobell claims that a single examination of the stools should develop about one third of the actual infection, while three examinations should show between one half and two thirds of the actual number of cases. Lynch [6] emphasizes that "only a few are considered competent to identify anything but the cyst." Definite identification of Endamoeba histolytica, therefore, is not only a difficult task but, at times, a time-consuming procedure which should be fully appreciated by the medical profession.

ROENTGEN OBSERVATIONS

Roentgen study of the colon was carried out in six of these cases. In four, cases 1, 6, 7 and 9, the roentgenograms were made before the specific therapy was started, and in two, cases 2 and 5, they were taken after a course of treatment had been completed. In case 5 a previous roentgen examination of the colon had been made elsewhere, two months before the diagnosis of amebic dysentery was made but several weeks after the onset of the illness. There are, therefore, the roentgenograms in five cases, 1, 5, 6, 7 and 9, before treatment and in cases 2 and 5 after the first course of treatment. Patient 6 is a child and was examined on the day of onset, and the roentgenogram failed to show any particular changes on the films except possibly a slight spasm of the descending colon. In case 2, a treated case, and case 9, an early case, the observations were doubtful but suggestive in the light of those in the roentgenograms of the remaining cases, 1, 5 and 7.

The roentgen observations in amebic dysentery confirm the presence of the characteristic pathologic lesions, which are confined at first to the cecum, ascending colon and rectum. Not only the mere presence of the lesion but the character of the lesion is portrayed, particularly as it affects the proximal segment of the colon.

In none of the cases is spasm a prominent feature; in fact, very little spasticity is noted during fluoroscopy. No appreciable abnormality is noted until the barium mixture reaches the proximal portion of the colon, which fills readily and shows no suggestion of spasm during the period of fluoroscopic observation. The cecum appears elevated and the lumen diffusely narrowed and contracted and its outline irregular. There is no usual soft flexibility on manipulation but, on the contrary, a distinct induration and resistance. The ileocecal valve is widely patent, allowing the mixture to flow freely into the terminal ileum. The terminal ileum, too, presents an appearance somewhat similar to that of the adjoining portion of the colon. The appearance of the colon, fluoroscopically as well as roentgenographically, is easily interpreted as being due to a diffuse, irregular infiltration or induration similar in character to chronic hyperplastic tuberculosis or possibly diffuse infiltration of a tumor such as leukemia or Hodgkin's disease. In the absence of active spasm, tuberculosis may be ruled out but not definitely. Our diagnosis in case 1 rested between a chronic nontuberculous inflammation and an infiltrating growth, involving the cecum and ascending colon. In the light of the subsequent development, it is now easy to interpret the manifestations as being due to amebic colitis. The filling defects are caused by multiple, deep irregular ulcers with an overhanging edge and a diffuse edema and exudation involving all the layers of the wall but particularly the submucosa. The narrowing of the lumen is doubtless caused by a great inflammatory thickening of the wall. The shortening of the cecum is probably due to the semipermanent, spastic contracture in the presence of diffuse inflammation and fibrosis. This also results in the induration of the ileocecal ring, which causes a constant backflow of the colonic contents and consequent involvement of the terminal ileum. A somewhat similar appearance is obtained in the transverse colon of patient 7, who had been ill with "colitis" for many weeks before the diagnosis was finally established. This merely indicates the extension of the process into this portion of the colon. The roentgenograms in case 2, obtained after the patient had been discharged, reveal little of the changes here described. This may be explained by the fact that too much repair had already taken place in the wall of the colon to show the changes that may be present during the active stage of the disease.

The roentgenograms in these cases represent a picture depicting a well established pathologic lesion in the cecum and the ascending colon. Roentgenograms in an earlier stage of the disease, if obtainable, may show active spasticity and less pronounced deformity, filling defect and induration, as are suggested by the observations in cases 6 and 9. In case 5, in which the presence of motile amebas in small numbers was noted at the time of discharge from the hospital, when the roentgenograms were made, small irregular defects along the transverse portion as well as along the sigmoid and the rectum were observed, indicating the presence of active pathologic changes in these areas.

3. Craig, C. F.: Further Observations on the Complement Fixation Test in the Diagnosis of Amebiasis, J. Lab. & Clin. Med. **18**: 873 (June) 1933. Craig, C. F., and Kagy, Edwin: A Study of Complement Fixation in Experimental Amebiasis in Dogs, Am. J. Hyg. **18**: 202 (July) 1933.

4. Sherwood, N. P., and Heathman, Lucy: Further Studies on the Antigenic Properties of Pathogenic and Free Living Amebae: II. Complement Fixation in Amebic Dysentery, Am. J. Hyg. **16**: 124 (July) 1932.

5. Craig, C. F.: Parasitic Protozoa of Man, Philadelphia, J. B. Lippincott Company, 1926, p. 43.

6. Lynch, K. M.: Protozoan Parasitism of the Alimentary Tract, New York, Macmillan Company, 1930, p. 40.

It should be emphasized that these roentgen observations are not specific for this disease but are merely an exact silhouette of the well established pathologic processes in the colon, occasioned by the invasion of Endamoeba histolytica, and may be of aid in determining the extent of involvement and in the differential diagnosis.

PATHOLOGY

No death occurred in this series of nine cases. No material was therefore available for histopathologic study, for which the standard textbooks on pathology and a large number of publications on this disease are available. A monograph on amebic dysentery by Councilman and Lafleur [7] is considered a classic on the pathology of amebiasis.

Fortunately, a small piece of tissue from the rectum in case 5 furnishes an example of a characteristic initial lesion of this infection and may be described in detail. It illustrates clearly the mode of invasion of these protozoa through the mucosa, which shows a slit or creta-like ulcer. This communicates with a large space in the submucosa caused by the cytolytic action of the invaders and filled with thick masses of mucus, containing only a few monocytes, neutrophils and eosinophils. One is impressed with a marked secretory activity of the epithelial cells and the type of exudate, which is nonpurulent and largely consists of mucus-like material. This may be considered an early, uncomplicated lesion due to the invasion of Endamoeba histolytica. A diligent search, in the serial sections, reveals a nest of amebas in the thick mucous secretion, which is adherent to the deep layer of the mucosa, constituting the inner lining of the space. With the advance of the process, coupled with the secondary infection that is bound to take place, this lesion will undoubtedly develop into a deep, irregular, undermining ulcer with an overhanging edge (figs. 3 and 4).

Amebic lesions elsewhere in the body as a complication of intestinal amebiasis are not uncommon in the tropics, though extremely rare in the Northern climate. Amebic liver abscess is occasionally encountered in Minnesota as a complication of a chronic amebic infection. I encountered in May, 1933, a case of amebic liver abscess rupturing into the pleural cavity, with metastatic pulmonary and cerebral abscesses and terminal embolic abscesses in the spleen and the wall of the small intestine, in which the only demonstrable primary amebic lesion in the colon was represented by a small infected diverticulum located in the sigmoid (fig. 6), though the stools contained, at times, Endamoeba histolytica in large numbers and actively motile. This case is an example of a chronic amebic carrier who had never experienced any intestinal disorders but succumbed to a widespread systemic complication.

CONCLUSIONS

1. Nine cases of amebic dysentery were recognized within a period of forty-seven days in a general hospital of an average size, in a Northern city of 250,000 population, in the United States. This is a unique experience. Infection in all nine cases was definitely traced to Chicago, which demonstrates, probably, a widespread dissemination of this disease throughout the country as a direct result of the Chicago epidemic.

2. The presenting symptoms show a wide variation, depending on the character of the attack and on the stage of the disease.

3. The initial symptoms, when elicited, are not always identical. There are atypical cases in which the first symptoms may be misleading or so insignificant and commonplace that no medical relief is considered necessary by the patient.

4. There is danger of a false positive report in the laboratory diagnosis of this disease by the inexperienced. Careful and painstaking search for the organism should be undertaken in suspected and neglected cases.

5. Roentgen examination may be of value as an aid in differential diagnosis.

6. Amebas were demonstrated in a section of a piece of tissue from the rectum, in a case suggesting a malignant growth. The histologic appearance of the lesion presents the characteristic initial changes due to the invasion of Endamoeba histolytica.

7. Councilman, W. T., and Lafleur, H. A.: Amebic Dysentery, Johns Hopkins Hosp. Rep. **2**: 395, 1891.

DOUBLE PULLEY TRACTION IN FRACTURES OF THE SHAFT OF THE HUMERUS

REPORT OF CASE

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It has been the custom in the surgical service of the Beekman Street Hospital to treat the majority of fractures of the shaft of the humerus with skin traction, using the Blake board, the forearm being suspended at right angles to the arm. This method, while it has produced good functional results, has definite disadvantages. The anatomic result is often only fair and may occasionally be termed poor. It is not feasible in compound fractures. There is a constant tendency for the adhesive to slip, and in some cases the irritation of the skin constitutes a real problem. When the patient is an unusually muscular individual or the fracture is compounded, pin traction through the olecranon or the lower end of the humerus is employed. This is an operative procedure of some technical nicety, of use only in adults, and the end-result may be no better than with the use of skin traction.

Some years ago, Russell [1] introduced his well known method of traction for use in the treatment of fractures of the femur. He described certain technical specifications at which he had arrived on an empirical basis that, on mathematical analysis, have been shown to subserve the main purpose of attaining more accurate axis traction. By observing these principles I have been able successfully to adapt a similar type of traction for use in humerus fractures.

The apparatus (fig. 1) consists of a broad, well padded cuff which partially encircles the elbow, with its pressure broadly distributed over the skin of the cubital fossa. There is a continuous length of rope leading from the cuff around single pulley *A* through part of double pulley *B*, to pulley *C*, which is incorporated in the hand spreader, and back to the other part of double pulley *B* to suspend the weight. The spreader is attached to the forearm by moleskin strips. The entire system is carried by a right angle frame, which is so constructed as to allow movement of pulleys *A* and *B* without releasing the traction. The frame is attached to the Gatch portion of the bed, so that the

From the surgical service of the Beekman Street Hospital.

1. Russell, R. H.: Fracture of the Femur; A Clinical Study, Brit. J. Surg. **11**: 491-502 (Jan.) 1924.

entire apparatus moves as the patient is raised up in bed without the essential angles being altered. The arm rests on a soft pillow and is held at 90 degrees abduction from the body. This side of the bed is raised on shock blocks about 3 inches. A Balkan frame is used merely to offer greater security to the traction frame and to help the patient adjust himself in bed. It is not a necessary part of the apparatus.

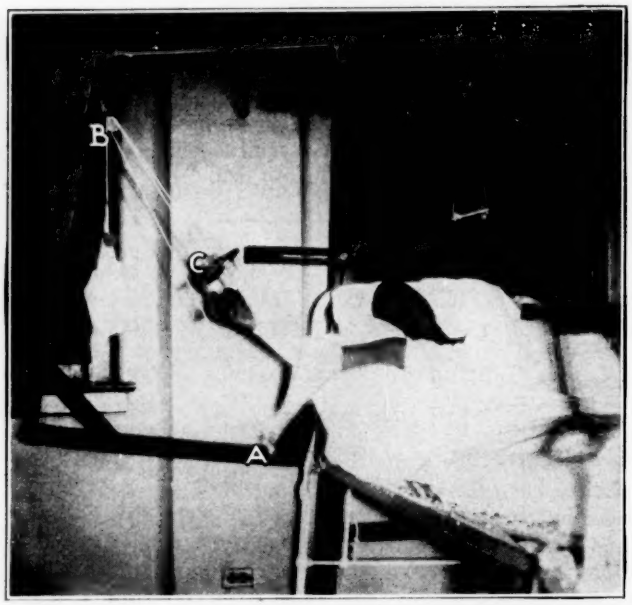


Fig. 1.—The patient as he actually appeared in the double pulley traction apparatus. He is shown with the head of the bed elevated to about 45 degrees. The lowest pulley is marked *A*, the one farthest from the patient is double pulley *B*, and the pulley on the hand spreader is marked *C*. The felt protecting the skin of the cubital fossa is completely hidden by the cuff. The shock blocks elevating this side of the bed are not visible.

We believe that there are definite advantages in the treatment of fractures of the shaft of the humerus with this system. It offers an easily adjustable method of attaining mathematically accurate axis traction (fig. 2). There are two directions of pull, as shown in figure 2. One is somewhat downward (*OA*), transmitted through the cubital cuff, and is equal in force to the suspended weight. The other (*OB*) is upward, transmitted through the hand spreader, and is equal in pull to twice the suspended weight, since it is a double pulley system. The resultant (*OC'*) of these forces, lies one third of the distance nearer the greater force (*OB*). By simple adjustment of the pulleys on the frame, these angles can be so arranged in any given case as to throw the resultant in accurate alinement with the proximal fragment. The arrangement can be made by gross estimate and can be accurately checked by measuring the angles on the roentgen film with a protractor. The resultant pull is usually equal to a little more than twice the suspended weight.

In the second place, the entire arm is free. This is of importance in compound fractures and is of readily apparent value in the administration of physical therapy. In other types of traction, any attempt at elevating the head of the bed inevitably results in some alteration of the line of traction, with the false point motion at the site of fracture. In this system the essential angles are not altered by raising the patient in bed. This has been checked by the fluoroscope. The advantage of being so able to elevate the head of the bed, especially in elderly patients, is quite obvious.

REPORT OF CASE

N. A., a Negro youth, aged 13, admitted to the Beekman Street Hospital, May 7, 1933, had just injured his right arm in the subway. Clinical and fluoroscopic examinations of the arm, to which emergency traction had been applied, revealed an oblique fracture at the junction of the middle and lower thirds of the shaft of the humerus. There was about half an inch overriding and definite anterior angulation. He was immediately put up in double pulley traction with 3 pounds weight. After seven hours, it was noted that the anterior angulation was still clinically obvious, and so a half pound was added. A roentgenogram after twenty-four hours revealed excellent alinement with no angulation nor overriding. By measuring the angles with the protractor and calculating the resultant, we discovered that we had empirically attained what was mathematically the correct line of pull. The weight was reduced to 3 pounds to avoid overpull and the roentgen check-up, twenty-four hours later, showed no change. The patient during this time was perfectly comfortable, the only sedatives used being phenobarbital and codeine, which were given for the first three nights. There was no complaint of antecubital pressure, or of tingling or numbness of the fingers, and the patient was raised up for meals and lowered to the supine position in the evening. He was able to pronate and supinate his forearm. On the fifth day, a sling balanced by a weight was substituted for the pillow as support for the arm. A check-up film, after twenty-four hours, revealed that the addition had so disturbed the equilibrium of forces by its anterior pull as to result in an anterior angulation with a deviation of 22 degrees of the lower fragment. To remedy this, the original pillow was restored; the sling was discarded and the angles of the apparatus were adjusted, without a change being made in the weight, so that the resultant was again in alinement with the proximal fragment. We were successful in correcting the position so that on the lateral roentgen view there was only 10 degrees anterior bowing, and on the anteroposterior view the alinement was almost exact. A roentgenogram on the seventeenth day revealed the presence of callus, which was even more evident on the twenty-sixth day.

On the thirty-seventh day, it was felt that the patient could with safety be removed from the apparatus. This was done, and he was allowed up with the extremity in a sling, and bass-

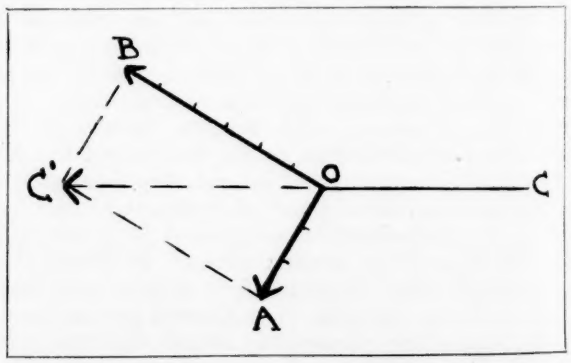


Fig. 2.—*OC* represents the line of the shaft of the humerus. *OA* is the line of force pulling through the cubital cuff; its length is equal to three units (or pounds). *OB* is the line of force pulling through the hand spreader; its length is equal to six units (or pounds). *OC'* represents the resultant pull both in direction and in force; it can be arithmetically calculated or can be worked out trigonometrically, as here shown, by taking it as the diagonal of the parallelogram of forces.

wood coaptation splints to the arm. There was no evidence of any impairment of function of the elbow joint. Active motion was immediately instituted.

COMMENT

I believe that this is a simple, easily applied type of traction, which involves neither operative procedure nor anesthesia and offers certain definite advantages in the treatment of fractures of the shaft of the humerus.

117 Beekman Street.

TRACING THE TRANSMISSION OF SYPHILIS

DUDLEY C. SMITH, M.D.
AND
WILLIAM A. BRUMFIELD, JR., M.D.
CHARLOTTESVILLE, VA.

There is an attitude of aloofness shown by physicians in all branches of medicine toward the prevention of syphilis. This is due partly to the absence of proper example and leadership by the syphilologists, syphilis clinics and epidemiologists. Sexual transmission with its moral aspects has seemed to be an insurmountable hazard but is actually only a mental handicap. In fact, this type of close contact makes a source of infection easier to determine.

The average physician and specialist does not often look beyond the syphilitic patient. He shies away from seeming to seek patients and becoming embroiled in domestic affairs. Some of this attitude is due to false professional ethics and part is due to lack of energy and patience. The problem is such an enormous one

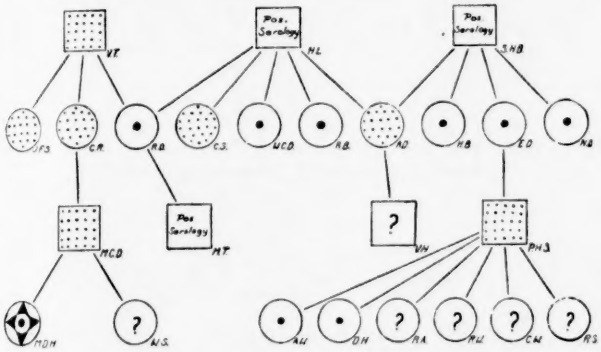


Chart 1.—Group in which all follow-up measures were used.

when tackled in a wholesale way that most epidemiologists have not had the daring to assail it.

All of the facts necessary for an effective epidemiologic attack against syphilis are known, at least to the point of practical application. Several lines of approach to the problem are frequently mentioned. These are education (lay and professional), medical prophylaxis, isolation of infectious cases, modern treatment, determination of sources of infections and follow-up of contacts. Prophylaxis, treatment and isolation have received the greatest attention in parts of Europe, and it is estimated that the incidence of syphilis has decreased 50 per cent. Education, particularly as related to sex hygiene and morality, has had the major rôle in the United States, and apparently it has been of little value in preventing the spread of the disease. The horrible ogre of immorality has caused the laying aside of valuable prevention tools. The American epidemiologists and syphilologists have joined hands with the societies for the suppression of vice instead of setting to work against this communicable disease. It is true that the public, syphilitic persons and others, has traditional feelings about this malady and its relation to vice. The medical man should consider this as a fact but should not be forced off the main track by it. Thought has been centered too much on removing the sin rather than reducing the penalty.

The determination of the sources of infection and the follow-up of contacts have not received either abroad or in this country the emphasis they merit. These phases, analogous to the carrier problems of other communicable diseases, have all but been completely ignored both in practice and in the literature. Sources of infection may be easily determined since only a few persons would be suspected. Elaborate investigation is unnecessary. The patient in the office or clinic may be depended on to give the desired information.

It has been assumed that the follow-up of contacts and the follow-back to the origin of the contagion is idealistic but impracticable, because patients will not divulge the names of sexual partners. It can be stated emphatically that such is not the case. This method of approach has been carried out as a routine measure for the past several years in the University of Virginia Hospital and Clinic, and the results are quite requiting. In some instances the patients are unable to name their consorts, but in only two occasions have we had patients deliberately refuse to name them. In one of these episodes a second patient was the means of clearing up the focus.

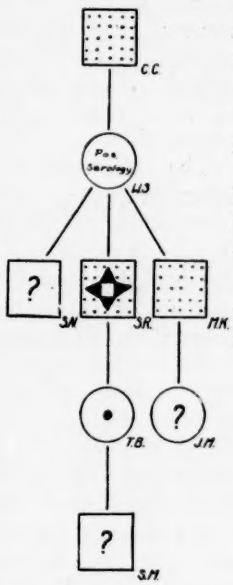
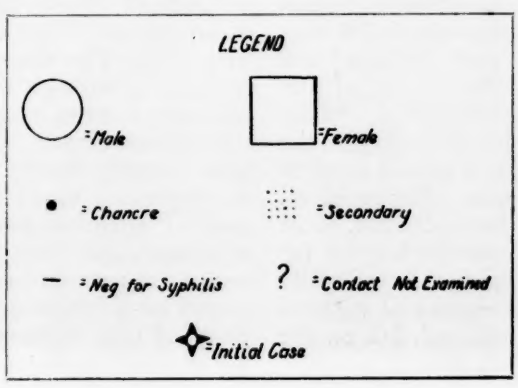


Chart 2. — Illustrative group showing contacts of a syphilitic patient.

This investigation requires a considerable amount of patience and tact. The subject is approached slowly, every effort being made to gain the confidence of the patient. The nature of the disease is explained in detail. After the various phases of the disease relating to the patient himself are discussed, the facts of the infection in regard to others are enumerated. When it is felt that the person's cooperation is attained, maneuvers toward securing possible sources of infection and contacts since infection are made. If the first attempt is unsuccessful, other attempts may break the barrier. Usually several efforts at different visits are necessary before all the relevant information is obtained. The names and addresses of all contacts and consorts are determined. These are not recorded in writing in the presence of the patient.

The contact without a complaint who comes in for consultation offers a slightly different type of problem. It is explained why he was advised to come for examination. Emphasis is placed on this attempt to look after his safety and the welfare of others. The importance of syphilis as a disease



From the Department of Dermatology and Syphilology, University of Virginia.

Read before the Section on Dermatology and Syphilology at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 15, 1933.

is stressed. He is also questioned about other contacts. He is asked for the names of other persons who have been associated with any of his consorts. When the patient or contact hesitates to reveal names, he is urged to advise personally those who he knows or thinks might have been exposed to seek medical advice. A number of patients and exposed contacts are thus developed into effective sanitary officers.

Occasionally a contact or patient denies sex episodes at first, but when confronted with the fact that another patient has already named him or her, they begin to talk. As an example, a girl with condylomata lata, who flatly denied sexual relations at first, when interviewed tactfully, admitted one exposure. She was told that some one else had named her as a contact. Before she left the clinic she had revealed the names of seven sexual companions and had not named the person already known. In another instance, a young married woman with secondary lesions denied extramarital exposures in the beginning. During the interview she named six extramarital contacts and revealed the names of four women associated with her in clandestine prostitution.

The follow-up of contacts and tracing sources of infection in order to be most effective should be started immediately. Infectious patients should be started on sterilizing therapy as quickly as possible so as to reduce the period of contagiousness and all suspects gotten under observation to make it possible to begin treatment at the first diagnostic evidence of infection. The patient is instructed to try to get his or her contacts to be examined and advised. Letters are sent to the contacts requesting them to report for examination. A nurse may visit the contacts and urge them to see the physician. When all other measures fail, the suspects are reported to the health officer.

To have contacts come for examination through the advice of their friends or associates is ideal. Each new patient informs his friends in turn until all contacts are brought under observation. A small group which was cleared up entirely in this way is shown in chart 3. The first male in the group advised the second, who in turn advised the other three.

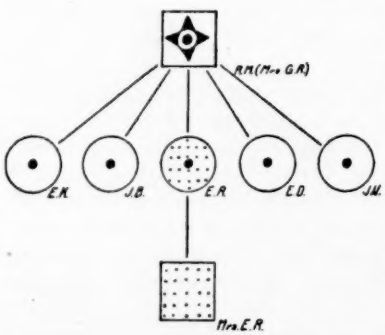


Chart 3.—Illustrative group showing contacts of a syphilitic patient.

Letters constitute the second method of search. A letter is sent, advising the contact to be examined since he has a friend getting treatment for a serious infectious disease and pointing out the possibility that he also may have acquired it. No mention of syphilis is made, although it is written on the stationery of the department. If no response is had, a second letter is mailed strongly advising examination. Copies of all letters are put with the suspect's hospital chart, if he has one, and then if he should report to the hospital for any purpose he will be properly referred. Occasionally the patient is unable to give the addresses of contacts and a few letters are returned unclaimed, but on the whole the results have been very satisfactory.

An intelligent nurse can persuade contacts to report when other methods have been unsuccessful. The aid of the health department is solicited only as a last resort: persuasion is better than enforcement procedures.

Indexed punch-cards were made in our clinic and private practice covering a period of about twenty months and from these the following data were tabulated. Exclusive of family surveys in heredosyphilis, cases in which sources of infection were not known or could not be reached and late or tertiary cases, there were 119 patients questioned. There were 242 names of contacts given. There were 196 individual names, exclusive of duplicates. There were 93 cases of syphilis discovered and treated by us. The number of persons stimulated to seek examination and treatment elsewhere is not known.

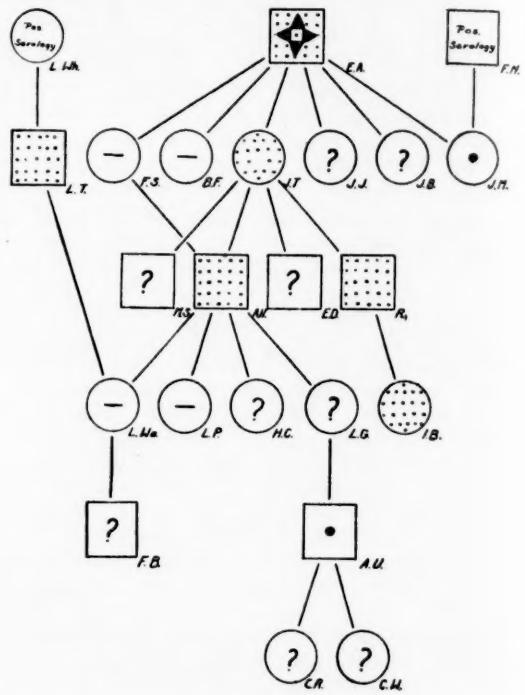


Chart 4.—Illustrative group showing contacts of a syphilitic patient.

Tables 1 to 5 summarize promiscuity rate, contact rate, infection rate, stage of infection of source cases and results of case investigations.

Chart 1 shows a group in which all follow-up measures were used. Nineteen (thirteen men and six women) in this group of twenty-five persons were investigated in the clinic. All of these were found to be infected. Seven had secondary lesions at the time of admission. Nine men had primary lesions at their first visit. The diagnosis was made in three women by positive serologic tests. All of the men and five of the women were handled by letters or messages and the visiting nurse. The aid of the health department was necessary in one instance. Undoubtedly some of these persons would have eventually obtained proper medical attention had a follow-up study not been attempted, but they were brought under treatment earlier than would have been the case otherwise. The period of infectiousness was shortened and the possibility of cure increased. The diagnosis was made at the earliest possible moment in those persons seen dur-

TABLE 1.—*Discovery of Exposed Persons Through Questioning of Original Patient and Admissions to the Clinic Consequent on Follow-Up*

	Original Cases	Contacts: Named	Contacts: Persons Represented	Consequent Admissions: Voluntary No.	Voluntary %	Follow-Up No.	Follow-Up %	Total No.	Total %
White	52	104	83	14	16.8	33	39.7	47	56.5
Negro	67	138	113	13	11.5	33	29.2	46	40.7
Total	119	242	196	27	13.7	66	33.7	93	47.4

TABLE 2.—*Admissions to the Clinic of Persons Named as Contacts by the Original Patient Consequent to Various Agencies of Approach or Because of Their Own Volition*

Follow-Up Through:	White M.	White F.	Negro M.	Negro F.	Total M.	Total F.	Total Both
Friends	13	4	3	5	16	9	25
Letters	2	6	1	4	3	10	13
Clinic physician	4	1	15	3	19	4	23
Health officer	0	3	0	2	0	5	5
	19	14	19	14	38	28	66
Voluntary	7	7	3	10	10	17	27

TABLE 3.—*Number of Exposed Contacts per Case and Estimated Number of Infected Contacts per Case Obtained by Follow-Up Investigation*

	Original Cases (a)	Exposed Contacts: Total No. (b)	No. per Case (c)	Admitted to Clinic: Total No. (d)	No. Found Infected (e)	Per Cent Infected (f)	Estimated: Total No. Infected* (g)	No. Infected per Case (h)
White	53	83	1.59	47	40	85.1	71	1.37
Negro	67	113	1.68	46	34	73.9	84	1.25
Total	119	196	1.64	93	74	79.6	155	1.30

* Estimated total number infected obtained by applying percentage in sample group (d) to total number of exposed contacts (b).

TABLE 4.—*Number of Exposed Contacts and Estimated Number of Infected Contacts per Case Known to be Source of at Least One Infection*

	Source Cases (a)	Exposed Contacts: Total No. (b)	No. per Case (c)	Admitted to Clinic: Total No. (d)	No. Infected (e)	Per Cent Infected (f)	Estimated: Total No. Infected (g)	No. Infected per Case (h)
White	20	54	2.7	43	38	88.3	48	2.4
Negro	23	46	2.0	34	31	91.2	42	1.8
Total	43	100	2.3	77	69	89.6	90	2.1

TABLE 5.—*Disease Manifestations in Forty-Three Cases Known to be the Source of at Least One Other Infection*

Disease Manifestations in Source Cases	White M.	White F.	Negro M.	Negro F.	Total M.	Total F.	Total Both No.	Total Both %
Primary	5	2	2	0	7	2	9	21
Secondary	2	7	3	7	5	14	19	44
Early asymptomatic	0	4	5	6	5	10	15	35
Total	7	13	10	13	17	26	43	100

ing the incubation period. Instructions to the latter group prevented them from transmitting the infection to others.

Charts 2, 3 and 4 are illustrative groups. Other details are shown in demonstration in the Scientific Exhibit.

SUMMARY

It is practical to trace sources of infection and exposures in syphilis. By these measures a larger proportion of cases are brought under observation, the period of infectiousness reduced and the secondarily infected ratio thereby decreased.

ABSTRACT OF DISCUSSION

DR. THOMAS PARRAN, JR., Albany, N. Y.: The authors have presented a new method in the control of syphilis, which to my mind is as important as the discovery of a new drug. It is up to the medical profession of this country to decide whether or not it will avail itself of this new weapon. The work of Drs. Smith and Brumfield is quite conclusive in showing that it is practical both in white and in Negro patients to trace the source of infection and to bring the sources under treatment. A physician would not consider treating a case of smallpox without investigating fully the source of infection. He would either undertake this himself or report to the health department and expect the health department to make the investigation. On the other hand, one does not feel any such responsibility in cases of early syphilis. Yet the tracing of the source of syphilis is no more difficult than tracing the source of smallpox and is just as important. As a matter of fact, it is much easier, for the person knows more definitely the source from which he may have acquired the disease. Two years ago, Dr. Munson of my staff described seventeen epidemics of syphilis that had been traced to their source. About 100 patients were located in this series of outbreaks and most of them were brought under treatment. He has since reported an additional series of syphilis epidemics. It requires patience, ingenuity and tact, but the difficulties are not insurmountable. It is up to physicians to do one of two things—either accept this as their own responsibility or report to the health department in order that it may undertake the job. We have excellent cooperation from the medical profession in New York State in our program of venereal disease control. We have found that it is practical to use not only medical officers but trained public health nurses to make these epidemiologic investigations. Dr. Smith and his associates are to be congratulated on their work. They have shown clearly that they can get 50 per cent of these cases under treatment. I am convinced that syphilis is kept alive by a series of local epidemics, which can be traced and controlled. The authors say that syphilis is on the increase. My own investigations lead me to the same conclusion. In New York State we have found that there were 3,000 more cases under treatment in 1930 than in 1927. Similar studies by the U. S. Public Health Service show an increase also.

DR. DUDLEY C. SMITH, University, Va.: All of the 119 cases shown on the chart were in the first year of the disease. This shows that most syphilis is transmitted in the early stages. It is, of course, well known that in the later years of the disease there may be mucocutaneous relapses, which serve as sources of infection, although it is not of major epidemiologic importance. It is true, as Dr. Parran states, that new cases of syphilis occur in series of more or less segregated epidemics. It should be emphasized that in this entire group the aid of the public health department was not required except in one instance. The physician is undoubtedly best equipped to handle the sociological and diplomatic phase of syphilis. Tactful persuasion after acquiring the patient's confidence prepares the ground for the epidemiologic survey as well as laying the foundation so that the patient will continue to follow directions through a minimal standard of treatment. All types of patients, intelligent, ignorant, careless, neurotic, honest and criminal, can be led a long way by a skilful and persuasive physician.

HYPERINSULINISM, A DEFINITE DISEASE ENTITY

ETIOLOGY, PATHOLOGY, SYMPTOMS, DIAGNOSIS, PROGNOSIS AND TREATMENT OF SPONTANEOUS INSULOGENIC HYPOGLYCEMIA (HYPERINSULINISM)

SEALE HARRIS, M.D.
BIRMINGHAM, ALA.

Hyperinsulinism, also called the "hunger" disease because hunger, associated with weakness, nervousness and other manifestations of hypoglycemia, is the most constant symptom, has been known to exist for ten years.[1] At least a hundred cases have been reported by American and European clinicians, surgeons and pathologists who have made thorough studies of all phases of hypoglycemia due to the hypersecretion of the islet cells of the pancreas. Sufficient data have accumulated in medical literature to warrant the discussion of hyperinsulinism as a definite disease entity. In this paper the effort will be made to outline the etiology, pathology, symptoms, diagnosis and treatment of hyperinsulinism as derived from published reports of many cases and from ten years' study of the disease.

DEFINITION

Hyperinsulinism, the antithesis of diabetes mellitus (hypoinsulinism), may be defined as a disease of the pancreas resulting from the spontaneous excessive secretion of insulin by the islands of Langerhans and characterized clinically by hypoglycemia with its concomitant symptoms, i. e., hunger, weakness, nervousness, tremors, sweating, trembling and mental lapses. Unconsciousness and convulsions may occur in the severe cases.

Dysinsulinism is a condition, or disease, associated with the uncontrolled secretion of the islet cells of the pancreas resulting in hyperglycemia, alternating with or followed by hypoglycemia, and characterized clinically by symptoms of hypo-insulinism (diabetes mellitus), and at times by the syndrome of hyperinsulinism.

Hypo-insulinism (diabetes mellitus) is essentially a disease of the pancreas resulting from the deficient secretion of insulin by the islands of Langerhans and is characterized clinically by hyperglycemia, polyuria, polyphagia, polydipsia, emaciation and weakness. Gangrene of the lower extremities, carbuncles and acidosis, with and without coma, may occur in the neglected cases of hypo-insulinism.

FREQUENCY

No doubt, hyperinsulinism has existed as long as has diabetes and was not recognized, just as hyperthyroidism, now known to be a frequent disease, for a long time was considered a nervous disorder and was not recognized as a disease of the thyroid. Physicians now practicing medicine can remember when the first cases of appendicitis were recognized and operations performed; and it may be predicted that in the near future hyperinsulinism will become recognized as a comparatively frequent disease which in most cases is amenable to treatment, either by dieting or by surgery.

A chronological review[2] of the cases of hyperinsulinism reported in the United States and Canada up to 1931 indicates that hyperinsulinism not only is a frequent condition but that it may cause a wide range of symptoms which heretofore have been diagnosed as being due to other causes but which in reality are manifestations of insulogenic hypoglycemia. Marsh[3] in 1930 reported nine cases of hyperinsulinism, which occurred in his private practice. Jean Sigwald[4] and Rathery report a number of cases of hyperinsulinism ("hypoglycémie par hyper-pancréatie"). Sigwald also reviews a number of reported European cases and presents a large series of experiments on animals in which he describes the manifestations of hypoglycemia induced by varying doses of insulin. Sippe and Bostock,[5] in Sidney, Australia, in a review of the general subject of hypoglycemia, report twenty-five cases as having occurred in their private practice and in the Brisbane General Hospital. In discussing the frequency of chronic hypoglycemia they say: "In a large series of cases met with in general medical practice, the percentage of cases of hypoglycemia was 0.47 and that of diabetes 0.51. Thus it will be seen that hypoglycemia is practically as common as hyperglycemia."

Cammidge in 1930 reported 200 cases of "chronic hypoglycemia." He is of the opinion that the condition is of hepatogenous origin, though he considers that the pancreas may be a contributing factor in producing the hypoglycemia.

Judging from the number of cases of hyperinsulinism now being reported by many clinicians and from blood sugar studies in 3,076 cases, in my series of 6,641 adult patients largely ambulatory with gastro-intestinal and nutritional disorders, it seems probable that hyperinsulinism is almost as frequent as the opposite secretory disorder of the insulin-forming cells of the pancreas, hypo-insulinism (diabetes mellitus). Of the recorded fasting blood sugars on 3,076 patients, 535 were diabetic. Of the remaining 2,541 nondiabetic patients, 242 had hyperglycemia; i. e., fasting blood sugars above 0.120 per cent. No doubt many of these were cases of true diabetes, but most of the patients were under observation for only two or three days and the opportunity was not given for further study in their cases. Of the 2,541 nondiabetic cases, 218 showed hypoglycemia of varying degrees. Of these, 86 showed unmistakable symptoms of hyperinsulinism and dextrose tolerance tests or repeated fasting blood sugars confirmed the diagnosis. Fifty-eight of the cases of hypoglycemia presented symptoms of hyperinsulinism but were considered borderline cases, while seventy-four patients found to have hypoglycemia in the routine fasting blood sugar examinations had no symptoms of hyperinsulinism. It is probable that some of the latter two groups, if thoroughly studied, would prove to be hyperinsulinism.

Careful history taking, fasting blood sugars, dextrose tolerance tests, and blood sugar studies at the time of many heretofore unexplained nervous attacks, and in periods of unconsciousness with and without convulsions will prove that many of them are due to hyper-

Owing to lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the author's reprints.

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 15, 1933.

1. Harris, Seale: (*a*) The Etiology and Prevention of Diabetes—Hyperinsulinism by Exhausting the Islands of Langerhans May Be a Factor in the Production of Diabetes, Virginia State M. A., October, 1923; (*b*) Virginia M. A. Monthly **50:** 672 (Jan.) 1924; (*c*) Hyperinsulinism and Dysinsulinism, J. A. M. A. **83:** 729-733 (Sept. 6) 1924.

2. Harris, Seale: Hyperinsulinism: Review of Cases Reported in United States and Canada, Endocrinology **16:** 29-42 (Jan.-Feb.) 1932.

3. Marsh, H. E.: Hyperinsulinism with Report of Cases, Wisconsin M. J. **30:** 340-342 (May) 1931.

4. Sigwald, Jean: L'hypoglycemie, Paris, Doin & Cie., 1932.

5. Sippe, Clive, and Bostock, John: Hypoglycemia: A Survey and a Report of Twenty-Five Cases, M. J. Australia **1:** 217-219 (Feb. 18) 1933.

insulinism. The physician with laboratory facilities who keeps up with medical literature will find many cases of hyperinsulinism in his regular practice.

Since a number of cases of epilepsy and epileptiform attacks have been found to be associated with hyperinsulinism, every patient having petit mal and grand mal attacks should have thorough blood sugar studies made before he is stigmatized with the diagnosis of epilepsy. It is believed that many cases now diagnosed as idiopathic epilepsy soon will be classified as belonging to the severe type of hyperinsulinism, in which recurring attacks of unconsciousness and convulsions are symptoms.

ETIOLOGY

Since hyperinsulinism and diabetes (hypo-insulinism) are secretory disorders of the pancreas, it seems probable that the same causes may produce the two; and of these a previous, usually unrecognized, pancreatitis is perhaps the most important factor. The fact that several patients have been observed who have diabetes and hyperinsulinism (dysinsulinism) indicates that the two have a common origin. In one of my cases of subacute pancreatitis there was disturbed carbohydrate metabolism with symptoms of hyperinsulinism.

Probably the most important underlying or predisposing cause of the pancreatitis that precedes hyperinsulinism and diabetes is a diet deficient in vitamins. About twenty years ago, McCollum, Simmonds [6] and Parsons expressed the opinion that the rôle of food in the etiology of many diseases "involves increased susceptibility to infection, due to lowered resistance caused by faulty diet." McCarrison's [7] classic experiments seem to have proved that foods of low vitamin content predispose to all abdominal infections. Other nutritionists, Barnett Sure [8] in particular, stress the rôle of diets deficient in vitamins A and B in the etiology of abdominal infections. The anatomic and circulatory relations of the pancreas would seem to make it particularly vulnerable to secondary involvement from gallbladder, intestinal and other abdominal infections.[9] If it is accepted as a fact that faulty diets predispose to the infections that play a part in the etiology of pancreatitis, sugar-saturated, vitamin-starved Americans, i. e., those who live largely on white flour bread, white potatoes, white rice, lean meats, sugar saturated coffee, and sugar-laden desserts, with candy and soft drinks between meals, would seem to be prone to become victims of pancreatic disorders, including hyperinsulinism and diabetes.[10] With a damaged pancreas as a factor, and since the ingestion of carbohydrates stimulates insulogenesis,[11] it seems probable that the excessive use of sugars and starches in the American diet may play another important part as an exciting cause in the incidence of hyperinsulinism.

Focal infections from the mouth, tonsils, colon, rectum, prostate, and the uterus and its adnexa may be the primary causes of the pancreatitis that precedes hyperinsulinism. Likewise, the general infections such as typhoid, influenza and the diseases of childhood, particularly mumps, may involve the pancreas as a complication, and the pancreatitis may be unrecognized.

In one of my cases of epilepsy associated with hyperinsulinism the first attack occurred about four weeks after an abdominal injury from which the patient was in bed three weeks suffering from abdominal pain and tenderness, nausea and vomiting, symptoms that suggest injury to the pancreas. It therefore seems that trauma may be a factor in the etiology of hyperinsulinism.

Three diabetic patients with hyperglycemia have given clear histories of previous hypoglycemic symptoms, indicating that the first manifestation of dysfunction of the pancreas was hyperinsulinism, and diabetes was a sequence. One of these patients, with a history of hyperinsulinism before she became obese and developed diabetes, has a son who has typical symptoms of mild hyperinsulinism.[12] This suggests that the familial tendency exists in hyperinsulinism as in diabetes (hypoinsulinism). Sippe and Bostock express the opinion that "the hypoglycemic entity possesses a definite hereditary tendency."

Worry and other emotional disturbances, and overwork—particularly prolonged physical exertion, thus exhausting the suprarenals, which seem to act conjointly with the islet cells of the pancreas—may play a part in producing excessive and uncontrolled insulogenesis.

A number of the severe cases of hyperinsulinism have been proved to be due to adenomas of the pancreas (insulomas). In other cases, carcinoma of the islands of Langerhans has been found at operation or at necropsy. It seems probable that neoplasms of the pancreas may be as important factors in the etiology of hyperinsulinism as adenomas and other tumors of the thyroid are in the pathogenesis of hyperthyroidism.

PATHOLOGY

In several cases of hyperinsulinism in which operation has been done, normal appearing pancreases have been found. Histologic studies have not revealed any pathologic changes in those cases. It therefore seems that, as in diabetes, hyperinsulinism may occur without any demonstrable lesion of the pancreas.

Hyperplastic islet cells were found by Phillips [13] at necropsy on a Negro who died in a hypoglycemic attack. Phillips cited the case of Dubreuil and Anderodias [14] of giant islands of Langerhans in a child born of a diabetic mother. Phillips also cited a case reported by Gray and Feemster [15] of "compensatory hypertrophy and hyperplasia of the islands of Langerhans in the pancreas of a child born of a diabetic mother." The blood sugar of the child on the day it died was 0.067 per cent. It seems probable that at least in the severe cases of hyperinsulinism that have existed for some time there may be hyperplasia of the islet cells, though as in other glandular organs the insulogenic cells may function excessively without any evident change in the cell structure.

The first pathologically proved case of hyperinsulinism was reported by Wilder, Allan and Robertson.[16] A

6. McCollum, E. V.: The Newer Knowledge of Nutrition, New York, Macmillan Company, 1922. McCollum, E. V., and Simmonds, Nina: Food, Nutrition and Health, published by the authors.
7. McCarrison, Robert: Faulty Food in Relation to Gastro-Intestinal Disorder, J. A. M. A. **78**: 1 (Jan. 7) 1922.
8. Sure, Barnett: The Vitamins in Health and Disease, Baltimore, Williams and Wilkins Company, 1933, p. 185.
9. Harris, Seale: Pancreatitis as Related to Gastro-Intestinal and Gallbladder Infections, with Particular Reference to the Etiology of Diabetes, J. A. M. A. **81**: 1496-1499 (Nov. 3) 1923.
10. Harris, Seale: Sugar-Saturated Vitamin Starved America, Am. Med. **23**: 840 (Nov.) 1928.
11. John, H. J.: The Lack of Uniformity in the Insulin Reaction, Am. J. M. Sc. **172**: 96 (July) 1926.
12. Harris, Seale: South. M. J. **36**: 250 (June) 1933.
13. Phillips, A. W.: Hypoglycemia Associated with Hypertrophy of the Islands of Langerhans, J. A. M. A. **96**: 1195 (April 11) 1931.
14. Dubreuil, G., and Anderodias: Ilots de Langerhans giants chez un noveau né, issu de mére glycosurique, Compt. rend. Soc. de biol. **83**: 1490, 1920.
15. Gray, S. H., and Feemster, L. C.: Compensatory Hypertrophy and Hyperplasia of the Islands of Langerhans in the Pancreas of a Child Born of a Diabetic Mother, Arch. Path. & Lab. Med. **1**: 348 (March) 1926.
16. Wilder, R. M.; Allan, F. N.; Power, M. H., and Robertson, H. E.: Carcinoma of the Islands of the Pancreas, Hyperinsulinism and Hypoglycemia, J. A. M. A. **89**: 348 (July 30) 1927.

physician, aged 40, had recurring attacks of unconsciousness and convulsions (blood sugar, 0.030 per cent). Exploratory laparotomy revealed an inoperable carcinoma of the pancreas. The patient died a month later. Necropsy showed a carcinoma of the islands of Langerhans with metastatic nodules in the liver, which showed a distinct resemblance to the islet cells of the pancreas. An extract from the metastatic nodules in the liver injected into rabbits showed insulin activity. The report of this case presents one of the most thorough studies of hyperinsulinism that is recorded in medical literature.

Neoplasms of the islet cells of the pancreas associated with hyperinsulinism have also been studied and reported by Thalhimer and Murphy,[17] McClenahan and Norris,[18] Warren,[19] Howland and Campbell and their associates,[20] Graham and Womack,[21] Smith and Seibel,[22] and Bast, Schmidt and Sevringhaus.[23] Smith and Seibel's study of five adenomas found by operations and by autopsy on hypoglycemic patients probably present the most comprehensive report that has been made on the pathology of adenomas found associated with hyperinsulinism.

SYMPTOMS

The Mild Type.—In the mild cases of hyperinsulinism the patient complains most frequently of excessive hunger, weakness, nervousness, anxiety or irritability, one or two hours before meals. All these subjective symptoms are relieved by eating, only to recur three or four hours after meals and often during the night. In addition, there may be trembling, flushed face, or pallor, particularly around the lips, profuse perspiration and tachycardia. These symptoms may be exaggerated by exercise, overwork, either mental or physical, worry and other emotional disturbances. Recurring headaches and inability to concentrate the mind on work late in the afternoon have been observed. Fatigability and insomnia are frequent complaints. Vertigo, dyspnea, "smothering spells," cardiac palpitation and precordial

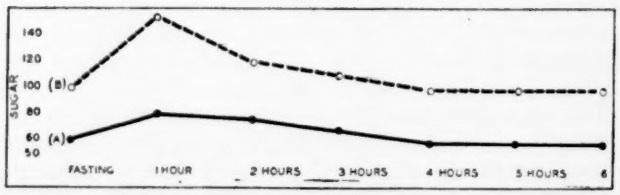


Chart 1 (case 1).—Hyperinsulinism. Complaint: hunger and weak spells. *A*, blood sugar curve, May 25, 1931, eight years after the diagnosis of hyperinsulinism had been made. *B*, average normal blood sugar curve. The blood sugar levels (hypoglycemia) were almost constant during ten years' observation. In the charts the sugar is given in milligrams per hundred cubic centimeters of blood.

pain have been noted and have been relieved by dieting, with frequent feedings between meals.

CASE 1.—H. J. R., a man, aged 52, a mechanic who was 5 feet 10½ inches (180 cm.) tall and weighed 139 pounds (63 Kg.) minimum, 186 pounds (84.4 Kg.) maximum, was seen, Oct. 5, 1923, with the following symptoms: extreme hunger, weakness, nervousness, trembling and profuse perspiration just before the noon and evening meals and at night. The "hunger spells" were relieved by eating. The symptoms were controlled by a low carbohydrate diet and frequent feedings. With lapses in diet the "hunger spells" come on, which are relieved by eating.

In the mild cases the fasting blood sugar usually ranges between 0.075 and 0.060 per cent, and the dextrose tolerance curve is of the low flat type that even in one hour does not go higher than 0.110 per cent and in two or three hours has fallen to 0.060 per cent and in some cases lower. Normal fasting blood sugars have been noted at times with patients who have hypoglycemic symptoms, but at other times the level in the same patients is abnormally low. Therefore, repeated

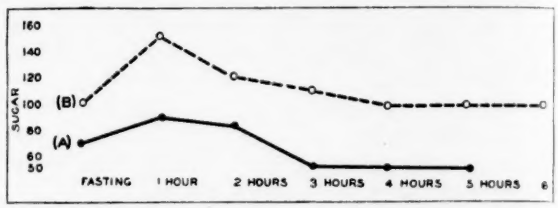


Chart 2 (case 2).—Moderately severe hyperinsulinism following unregulated reduction regimen: psychasthenia or actual psychosis. *A*, low flat blood sugar levels, particularly one and two hours after 100 Gm. of dextrose was given. *B*, average normal blood sugar level.

fasting blood sugar tests should be made before the diagnosis of hyperinsulinism is made or is abandoned. In some cases, not all, the patient's hypoglycemic symptoms are reproduced when his blood sugar falls to its lowest level after a dextrose tolerance test.

Mild cases of hyperinsulinism have also been reported by Gibson and Larimer,[24] John,[25] Liu Shih-Hao and Chang Hsiao-Chien,[26] Pribram,[27] Hoxie and Lisherness,[28] Winans,[29] Waters,[30] Sexton,[31] Marsh,[3] Sippe and Bostock,[5] and others. The authors mentioned, in their published reports of their cases, have described many of the symptoms outlined as occurring in the mild types of hyperinsulinism.

Moderately Severe Type.—In the moderately severe cases of hyperinsulinism the symptoms outlined as occurring in the mild type may be present in an exaggerated form. The hunger, weakness, nervousness, trembling and sweating are more pronounced, and eating gives relief for only one or two hours when more food is demanded, in order that the victim can continue to perform his regular duties. This type appears more frequently in women who complain that they are so weak before breakfast that they cannot do anything. They feel better after breakfast for an hour or two and then become so weak that they have to go to bed; or they learn that they can eat and in a few minutes feel strong enough to go back to work. The vicious circle of getting hungry and weak and eating keeps up until the victim becomes obese. Many of the moder-

17. Thalhimer, William, and Murphy, F. D.: Carcinoma of the Islands of the Pancreas: Hyperinsulinism and Hypoglycemia, J. A. M. A. **91:** 89 (July 14) 1928.
18. McClenahan, W. U., and Norris, G. W.: Pancreatic Adenoma with Hypoglycemia, Am. J. M. Sc. **177:** 93 (Jan.) 1929.
19. Warren, Shields: Adenomas of Islands of Langerhans, Am. J. Path. **2:** 335 (July) 1926.
20. Howland, Goldwin; Campbell, W. R.; Maltby, E. J., and Robinson, W. L.: Dysinsulinism: Convulsions and Coma Due to Islet Cell Tumor of the Pancreas with Operation and Cure, J. A. M. A. **93:** 674 (Aug. 31) 1929.
21. Womack, N. A.; Gnagi, W. B., Jr., and Graham, E. A.: Adenoma of the Islands of Langerhans: Successful Operative Removal, J. A. M. A. **97:** 831-836 (Sept. 19) 1932.
22. Smith, Margaret G., and Seibel, M. G.: Tumors of the Islands of Langerhans and Hypoglycemia, Am. J. Path. **7:** 723-745 (Nov.) 1931.
23. Bast, T. H.; Schmidt, E. R., and Sevringhaus, E. L.: Pancreatic Tumor with Status Epilepticus, Acta chir. Scandinav. **71:** 82-102, 1932.
24. Gibson, R. B., and Larimer, R. N.: Hypoglycemic Symptoms Provoked by Repeated Glucose Ingestion in Case of Renal Diabetes, J. A. M. A. **82:** 468 (Feb. 9) 1924.
25. John, H. J.: Hyperinsulinism, Ohio State M. J. **21:** 99 (Feb.) 1925; Hyperinsulinism, Surg., Gynec. & Obst. **44:** 190 (Feb.) 1927.
26. Shih-Hao, Liu, and Hsiao-Chien, Chang: Hypoglycemia, Arch. Int. Med. **36:** 146 (July) 1925.
27. Pribram, Ernst: Chronic Glycopenia: Clinical Picture, Analysis of Its Causes and Suggestions for Its Therapy, J. A. M. A. **90:** 2001 (June 23) 1928.
28. Hoxie, G. H., and Lisherness, G. M.: Hypoglycemia, Am. J. M. Sc. **173:** 220 (Feb.) 1927.
29. Winans, H. M.: Chronic Hypoglycemia, South. M. J. **23:** 402 (May) 1930.
30. Waters, W. C., Jr.: Spontaneous Hypoglycemia: The Rôle of Diet in Etiology and Treatment, South. M. J. **24:** 249 (March) 1931.
31. Sexton, D. L.: South. M. J. **24:** 251 (March) 1931.

ately severe cases reported have shown overweight; the effort to reduce has exaggerated the symptoms of hyperinsulinism to such an extent that some of the patients had attacks of what has been diagnosed as hysteria of the grave type, and some have been thought to be psychotic.

CASE 2.—Mrs. A. E. W., aged 43, 5 feet 2 inches (157.5 cm.) tall, had reduced from 210 to 133 pounds (from 95 to 60 Kg.) in the past year. About two or three hours after meals and during the night she had spells of weakness, nervousness, mental lapses and irritability and was unable to do her housework. She was mentally depressed and had ideas, or delusions, of persecution. The question of sending her to a psychopathic hospital was considered. She would feel better and stronger after eating but had been dieting to reduce by not eating supper. Glycosuria was present at times. The patient was very much improved by a low carbohydrate, moderately high fat diet for three meals and orange juice or tomato juice every one or two hours between meals. Her mental and physical condition was much improved.

In some of the moderately severe cases there are brief mental lapses, resembling petit mal attacks. In fact, several cases have been reported in which petit mal attacks had been found associated with hyperinsulinism and in which the attacks were controlled by dieting. In the more severe cases there may be brief periods of actual unconsciousness, and transient hemiplegias may occur.

In the moderately severe type the fasting blood sugar level usually ranges from 0.060 to 0.050 per cent, though in some cases it may be above 0.060 per cent, or fall below 0.050 per cent. The symptoms may or may not be reproduced by a dextrose tolerance test when the blood sugar runs lower than 0.055 per cent.

Moderately severe cases of hyperinsulinism have been reported by many other clinicians whose published articles have described the symptoms mentioned in this article. Among the authors whose contributions have enriched the literature on the symptoms of hyperinsulinism may be mentioned: Jonas,[32] Sprunt,[33] Gammon and Tenery,[34] Heyn,[35] Cammidge,[36] Sendrail and Planques,[37] Stenström,[38] Rathery and Sigwald,[39] Escudero,[40] Ravid,[41] Shepherdson[42] and Krause,[43] and others, some of whose names have been listed, have reported mild cases.

The Severe Type.—The severe cases of hyperinsulinism are manifested by attacks of unconsciousness, either with or without convulsions. In some cases there is associated violent delirium. In one of the cases reported by Wilder[44] "the patient developed violent deliria, disturbances of sleep and somnambulism. He had to be confined to a straight jacket because of repeated attacks of manic delirium which were provoked whenever his blood sugar level fell below normal." Wilder concludes by saying: "It is probable that many of these cases are being dismissed with such diagnoses as hysteria, or epilepsy, or schizophrenia; and that more cases of hyperinsulinism will come to light when blood sugar determinations are made with greater frequency. The nervous manifestations of hyperthyroidism formerly led to this disease being included among the neuroses."

CASE 3.—A. H. B., a man, aged 22, a college student, 5 feet 9½ inches (177 cm.) tall, weighing 136 pounds (61.7 Kg.), seen, April 25, 1933, had had almost daily attacks of physical and mental exhaustion since November, 1931, when he became very nervous—"frightened and shaky"—an hour or two before meals. He drank four cups of coffee and two glasses of coca cola a day for relief of and to prevent attacks. Frequently he would become so weak that he would have to lie down before his noon meal. He always felt fine after eating. The symptoms grew worse until October, 1932, when he became dizzy and then unconscious for about twenty minutes; there were no convulsions. He had five attacks of unconsciousness after that. The anxious, nervous, weak feelings between meals have continued.

The patient was hospitalized for two weeks on a diet of 60 Gm. of carbohydrate, 60 Gm. of protein and 150 Gm. of fat, with food every one or two hours between meals and when he awoke at night. He has been free from symptoms except that slight weakness occurred one night about 11 o'clock,

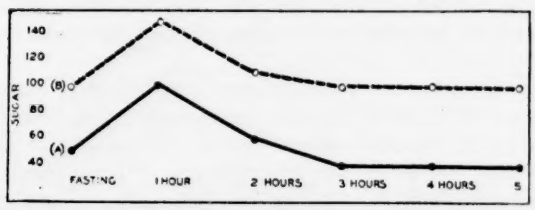


Chart 3 (case 3).—Severe hyperinsulinism: recurring attacks of unconsciousness. *A*, hyperinsulinism blood sugar curve. *B*, average normal blood sugar curve. When the blood sugar fell to 0.040 per cent the symptoms of the hunger attacks were reproduced; i. e., the patient became very weak and pale, particularly around the lips. He was very nervous and trembled but obtained immediate relief from eating.

but he was relieved immediately by taking orange juice. He has learned to weigh and measure food and calculate his menus to carry out the diet at home. He returned for a check up, May 29. He has had no symptoms except one time when he could not get orange juice or other food between meals. He then became weak and trembled but was relieved by eating. The fasting blood sugar was 0.066, compared with 0.05 per cent when the treatment was begun.

In many of the cases of the severe type a diagnosis of epilepsy had been made but abandoned when the attacks of convulsions were found to be associated with hypoglycemia, as in the cases of Neilson and Eggleston.[45] Several cases of what appeared to be true "idiopathic" epilepsy, in which the patients bit their tongues or received burns and other injuries while unconscious, were found to have been associated with hyperinsulinism.[46]

Sevringhaus, Schmidt and Bast[23] reported a case of hyperinsulinism with hypoglycemia (blood sugar, 0.040 per cent) in which the patient was in status epilepticus. Removal of a tumor (carcinoma) of the tail of the pancreas relieved the hypoglycemic symptoms.

In a number of the severe cases of hyperinsulinism the patients have appeared as if they were intoxicated

32. Jonas, Leon: Hypoglycemia, M. Clin. North America **8**: 949 (Nov.) 1924.
33. Sprunt, T. P.: South. M. J. **24**: 251 (March) 1931.
34. Gammon, G. D., and Tenery, W. C.: Hypoglycemia: the Clinical Syndrome, Etiology and Treatment: Report of a Case Due to Hyperinsulinism, Arch. Int. Med. **47**: 829 (June) 1931.
35. Heyn, L. J.: Hyperinsulinism, J. A. M. A. **98**: 1441 (April 23) 1932.
36. Cammidge, P. J.: Hypoglycemia, Lancet **2**: 1277 (Dec. 20) 1924; Spontaneous Hypoglycemia, Practitioner **119**: 102 (Aug.) 1927; Chronic Hypoglycemia, Brit. M. J. **1**: 807-848 (May 3) 1930.
37. Sendrail, M., and Planques, J.: The Condition of Hypoglycemia, Gaz. d. hôp. **100**: 1105 (Aug. 20), 1137 (Aug. 27) 1927.
38. Stenström, T.: Spontaneous Hypoglycemic Reactions in a Nursing Woman, Deutsches Arch. f. klin. Med. **153**: 181, 1926.
39. Rathery, F., and Sigwald, Jean: Spontaneous Hypoglycemia: L'hypoglycemia, (Sigwald) Paris, Doin & Cie, 1932, p. 147.
40. Escudero, cited by Sigwald: L'hypoglycemia, p. 143.
41. Ravid, J. M.: Transient Insulin Hypoglycemic Hemoplegias, Am. J. M. Sc. **175**: 756 (June) 1928.
42. Shepherdson, H. C.: The Efficacy of High Fat Diets in the Treatment of Chronic Hypoglycemia, Endocrinology **82**: 182 (March-April) 1932.
43. Krause, F. (Düsseldorf): Hyperinsulinism with Symptom Complex of Hypoglycemia, Klin. Wchnschr. **9**: 2346 (Dec. 13) 1930.
44. Wilder, R. M.: Progress in Study of Internal Secretions, Internat. Clin. **1**: 293 (March) 1930.
45. Neilson, J. M., and Eggleston, E. L.: Functional Dysinsulinism with Epileptiform Seizures: Treatment, J. A. M. A. **94**: 860 (March 22) 1930.
46. Harris, Seale: Epilepsy and Narcolepsy Associated with Hyperinsulinism, J. A. M. A. **100**: 321-328 (Feb. 4) 1933.

from alcohol but would become normal after taking food. Some have complained of "crazy spells," and actual psychotic symptoms have been observed by several clinicians. In one of Graham's [47] cases the psychosis was relieved by the removal of two small adenomas, which appeared to be the cause of the hyperinsulinism.

Abdominal pain has been pronounced in several reported cases. The pain of severe hyperinsulinism has simulated appendicitis, gallbladder infection and duodenal ulcer, so that exploratory operations, with removal of the appendix and gallbladder and gastroenterostomies, have been performed without relieving the abdominal pain. The pain of hyperinsulinism usually is exaggerated during the attacks, though it may be present more or less constantly. In some cases it is more marked one or two hours after meals. The pain usually is in the upper part of the abdomen, sometimes radiating to the left. Tenderness over the pancreas may be elicited on deep pressure in some cases. It is probable that pain and tenderness over the upper part of the abdomen in hyperinsulinism occurs most frequently in cases in which there are adenomas or other tumors of the pancreas; but in a narcoleptic patient in whom abdominal pain was a prominent symptom, no pathologic changes of the pancreas were found at operation, which relieved not only the hypoglycemia but also the pain.[46] This patient, in addition to the abdominal pain, had the typical Gélineau [48] syndrome of narcolepsy; i. e., attacks of unconsciousness associated with cataplexy.

In severe cases of hyperinsulinism there is usually a history of mild symptoms for several years before the attacks of unconsciousness and convulsions supervened. In other words, in the severe cases of hyperinsulinism the symptoms may progress from those ordinarily observed in the reaction following an overdose of insulin to the symptoms observed in the moderately severe cases and then into the unconscious or convulsive period. Usually there are mild symptoms and often petit mal attacks between the attacks of unconsciousness and convulsions in the severe type.

Some of the most severe cases of hyperinsulinism appear to be of the acute fulminating type in which the patient goes into hypoglycemic coma and remains unconscious for hours before death occurs. In other patients, spontaneous recovery occurs after he has been unconscious for hours. In the severe cases of the epileptiform type, the patient may go for weeks or months without seizures and then have several grand mal attacks in a few hours. In most of the severe cases of hyperinsulinism reported there has been the tendency for the hypoglycemic attacks to become more frequent and progressively more serious unless relieved by dietary management or by surgery. As in the mild and moderately severe types of hyperinsulinism, in the severe cases the hypoglycemic attacks may be induced by mental or physical strain, worry, grief and other emotional disturbances.

The blood sugar levels in the severe type of hypoglycemia usually are very low, below 0.050 per cent. Readings of 0.040, 0.035 and 0.027 per cent have been found; in Weil's [49] case the blood sugar fell to zero. Woodyatt [50] and Millard Smith [51] have reported zero levels in hypoglycemia from overdoses of insulin, but both patients recovered after sugar administration. In two of Neilson and Eggleston's [45] cases of "epileptiform convulsions" the fasting blood sugar level was not very low, only 0.069 and 0.064 per cent. The dextrose tolerance test usually brings out much lower blood sugar levels than are found in the same patient when fasting blood sugars have been made. In several instances the convulsions and mental and nervous symptoms have been induced when the blood sugar fell very low from four to six hours after the 100 Gm. of dextrose was given. In one of my epileptic patients, a woman who had grand mal attacks during menstruation, in a dextrose tolerance test between catamenial periods the lowest blood sugar level was 0.060 per cent. She became weak and had to go to bed but had no convulsions. In the dextrose tolerance test made during menstruation, when a seizure was expected the blood sugar level went to 0.050 per cent, at which time she had a typical epileptic convulsion.

The severe cases of hyperinsulinism that have been reported have attracted more attention than have the milder types, perhaps for the reason that the symptoms have been serious and usually clear cut, and the results of medical and surgical treatment have been dramatic. Pathologic studies from specimens removed by operation, or at autopsy, have been productive of proof that hyperinsulinism is a definite disease entity due in many cases to neoplasms. Among those who have made important contributions to the study of the severe type of hyperinsulinism, associated with attacks of unconsciousness, with or without convulsions, may be mentioned Wilder and his associates,[16] Allan,[52] Thalhimer and Murphy,[17] the Finneys,[53] Hartman,[54] Howland, Campbell, Maltby and Robinson,[20] Neilson and Eggleston,[45] Carr, Parker, Grave, Fisher and Larrimore,[55] Schmidt and Carey,[56] Phillips,[13] Weil,[49] McGavern,[57] Womack, Gnagi and Graham,[21] Sevringhaus, Schmidt and Bast,[23] Holman,[58] Guy-Larache, Lelourdy and Bussiere,[59] Stenström,[38] Pettersson,[60] Krause,[48] and Sippe and Bostock.[5]

DYSINSULINISM

The uncontrolled secretion of insulin, excessive at times and resulting in hypoglycemia, which may alternate with or be followed by hypofunction of the islet cells with hyperglycemia, is manifested by inconstant symptoms of both hyperinsulinism and diabetes mellitus (hypo-insulinism). In some cases the hypoglycemic symptoms predominate and in others hyperglycemic phenomena are more pronounced. The symptoms of dysinsulinism may be mild and irregular, moderately

47. Graham, E. A., and Womack, N. A.: The Application of Surgery to the Hypoglycemic State Due to Islet Tumors of the Pancreas, Surg., Gynec. & Obst. **56:** 728-742 (April) 1933.
48. Gélineau: De la narcolepsie, Gaz. d. hôp. **53:** 626, 1880.
49. Weil, Clarence: Functional Hyperinsulinism—Epileptiform Convulsions Accompanying Spontaneous Hypoglycemia, Internat. Clin. **4:** 33-50 (Oct.) 1932.
50. Woodyatt, R. T.: J. Metabol. Research **2:** 793 (Nov.-Dec.) 1922; cited by Joslin, E. P.: Treatment of Diabetes Mellitus, Philadelphia, Lea & Febiger, 1928, p. 45.
51. Smith, Millard: Boston M. & S. J. **195:** 663 (Sept. 30) 1926; cited by Joslin: Treatment of Diabetes Mellitus, p. 46.
52. Allan, F. N.: Carcinoma of the Islands of Pancreas with Hyperinsulinism, Proc. Staff Meet., Mayo Clin. **2:** 89 (April 27) 1927; Hyperinsulinism, ibid. **3:** 367 (Dec. 19) 1928; Hyperinsulinism, Arch. Int. Med. **44:** 65 (July) 1929.
53. Finney, J. M. T.; and Finney, J. M. T., Jr.: Resection of the Pancreas, Ann. Surg. **88:** 584 (Sept.) 1928.
54. Hartman, F. L.: Hypoglycemia, M. Clin. North America **12:** 1035 (Jan.) 1929.
55. Carr, A. D.; Parker, Robert; Grave, Edward; Fisher, A. D., and Larrimore, J. W.: Hyperinsulinism from B-Cell Adenoma of the Pancreas: Operation and Cure, J. A. M. A. **96:** 1363 (April 25) 1931.
56. Schmidt, E. G., and Carey, T. N.: Terminal Hypoglycemia, Arch. Int. Med. **47:** 128 (Jan.) 1931.
57. McGavern, B. E.: Epileptoid Attacks and Hyperinsulinism, Endocrinology **16:** 293 (May-June) 1932.
58. Holman, Emile: Partial Pancreatectomy in Chronic Spontaneous Hypoglycemia, Surg., Gynec. & Obst. **56:** 591-600 (March) 1933.
59. Guy-Larache, Lelourdy and Bussiere, cited by Sigwald, L'hypoglycemia, pp. 140-141.
60. Pettersson, A. S.: A Case of Spontaneous Hypoglycemic Coma, Acta med. Scandinav. **69:** 232, 1928.

severe and bizarre, or so severe that attacks of unconsciousness and convulsions and hypoglycemic coma and death may occur in patients known to have diabetes.

Symptoms of dysinsulinism may be brought out in dieting diabetic patients, particularly in the mild overweight cases; but severe diabetes may coexist with severe hyperinsulinism. In such cases the hypoglycemic symptoms usually present the more serious problem.

My first case diagnosed as dysinsulinism was in January, 1924.[1c] An obese woman who a year before, when she weighed 210 pounds (95 Kg.) had had glycosuria, was sent to me as a diabetic patient. She had reduced, by dieting, to 160 pounds (72.6 Kg.), and complained of having "spells of weakness and nervousness" at about 1 or 2 o'clock in the morning. She had found from experience that eating would relieve the symptoms, so that she kept an orange or a glass of milk on the table by her bed. Her blood sugar during an attack was 0.047 per cent. She was relieved promptly by frequent feedings of a low carbohydrate diet, consisting largely of the 5 and 10 per cent vegetables and fruits, with sufficient proteins and fats. Since then I have had three other cases of dysinsulinism.

CASE 4.—C. H. M., a man, aged 41, a laundry manager, 5 feet 5 inches (165 cm.) tall, weighing 127 pounds (57.6 Kg.), seen, Nov. 16, 1930, complained of polyuria, glycosuria, and a nervous, weak feeling in the middle of the morning and afternoon, which was relieved by taking food. The fasting blood sugar was 0.060 per cent. Glycosuria was present constantly for two years, 4 Gm. being excreted in twenty-four hours. The hypoglycemic symptoms were relieved on a weighed and measured diet of 120 Gm. of carbohydrate, 60 Gm. of protein and 180 Gm. of fat, with food every two hours, but the glycosuria persists. The patient increased his weight 12 pounds (5.4 Kg.). The fasting blood sugar, Oct. 16, 1932, was 0.085 per cent.

In the last few years, several similar cases have been reported and the low blood sugars have been attributed to hypersecretion of insulin by Jonas,[32] John,[25] Harrop,[62] Neilson and Eggleston,[45] Howland and Campbell and their associates [20] and Weil.[49]

DIAGNOSIS

A tentative diagnosis may be made from the symptoms; i. e., hunger, weakness, nervousness and the like (insulin reaction) in mild cases, and recurring attacks of mental lapses, convulsions, unconsciousness and coma in the severe cases. If the patient is relieved by reducing the carbohydrates and increasing the fats in his diet, with frequent feedings, the diagnosis of hyperinsulinism may be assumed. A positive diagnosis can be made only from repeated fasting blood sugar studies and carbohydrate tolerance tests showing hypoglycemia; i. e., blood sugar concentration below 70 mg. per hundred cubic centimeters, and by excluding all other causes of hypoglycemia except the excessive secretion of insulin by the islet cells of the pancreas.

The patient receiving a dextrose tolerance test should be observed very carefully to determine his reaction to the low blood sugar levels in from three to five hours after the ingestion of the 100 Gm. of dextrose. In some such cases the symptoms of which the patient complains are reproduced. In one of the epileptic patients a typical grand mal seizure occurred while the patient was undergoing a dextrose tolerance test, when the blood sugar level fell to 0.050 per cent. Lennox and Cobb [63] in two out of seven times produced grand mal attacks in an epileptic patient by giving him insulin. In one of the seven times he was mentally confused but had no convulsion when the blood sugar level was 0.025 per cent. At other times the patient had epileptic attacks when his blood sugar was normal. Gammon and Tenery [34] reproduced the symptoms of hypoglycemia in their case of hyperinsulinism by giving the patient 10 units of insulin. It is hardly necessary to give insulin as a diagnostic procedure in hyperinsulinism because the blood sugar levels after a dextrose tolerance test usually are sufficiently low to give the patient mild hypoglycemic symptoms.

Every possible cause of hypoglycemia besides pancreatic disease should be considered, including studies of all the other organs of internal secretion, excluding them as factors if possible before making the diagnosis of hyperinsulinism in an epileptic or narcoleptic patient.

Since hyperinsulinism has been manifested by symptoms of hysteria of a psychoneurasthenia, neurocirculatory asthenia, psychoses, brain tumors, epilepsy, narcolepsy, status epilepticus, epileptiform convulsions, appendicitis, gallbladder infection, duodenal ulcer and other diseases, a differential diagnosis from those conditions can be made by blood sugar studies. Hyperinsulinism is invariably associated with hypoglycemia. It should be remembered, however, that, in patients who have hypoglycemic symptoms, fasting blood sugars are not always low. Therefore, repeated and varied

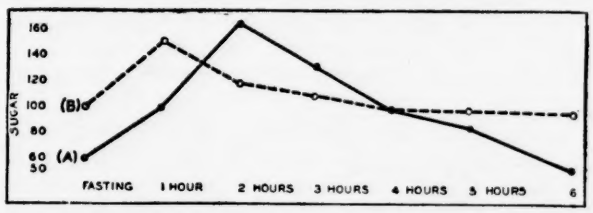


Chart 4 (case 4).—Dysinsulinism: mild diabetes and hypoglycemic symptoms. *A*, low fasting blood sugar rising slowly above normal with slow drop to subnormal level. *B*, average blood sugar curve.

blood sugar studies should be made before hypoglycemia is excluded in suspected cases of hyperinsulinism. It should be remembered also that the patient with hyperinsulinism may have other diseases that may or may not affect the hypoglycemic symptoms. Thus, two cases of hyperinsulinism in syphilitic patients have been observed in which antisyphilitic treatment did not affect the blood sugar levels or the symptoms of hypoglycemia.

Cases of marked degrees of hypoglycemia due to organic diseases, or functional disturbances of other organs besides the pancreas, have been reported as having been due to (*a*) deficient glycogenesis in the liver, from poisons such as arsphenamine or other arsenicals, phenylhydrazine, phosphorus or other hepatotoxins (Cross and Blackford [64]), and from massive tumor of the liver (Nadler and Wolfer [65]); (*b*) inadequate mobilization of glycogen due to deficient secretion of the suprarenals, as in the case reported by Anderson,[66] in which the autopsy revealed an adenoma of the left suprarenal gland, and in Addison's disease (Wadi [67]); (*c*) pituitary dysfunction (Cushing,[68] Josef

63. Lennox, W. G., and Cobb, Stanley: Epilepsy, Medicine **7**: 105-290 (May) 1928.

64. Cross, J. B., and Blackford, L. M.: Fatal Hepatogenic Hypoglycemia Following Neoarsphenamine, J. A. M. A. **94**: 1739-1743 (May 31) 1930.

65. Nadler, W. H., and Wolfer, J. A.: Hepatogenic Hypoglycemia Associated with Primary Liver Cell Carcinoma, Arch. Int. Med. **44**: 700 (Nov.) 1929.

66. Anderson, H. B.: A Tumor of the Adrenal Gland with Fatal Hypoglycemia, Am. J. M. Sc. **180**: 71 (July) 1930.

67. Wadi, W.: Ueber Hypoglykämie bei Morbus Addisonii, Klin. Wchnschr. **7**: 2107 (Oct. 28) 1928, cited by Cross and Blackford.[64]

68. Cushing, Harvey: The Pituitary Body and Its Disorders, Philadelphia, J. B. Lippincott Company, 1912.

Wilder[69]); (*d*) thyroid dysfunction, a possible factor in the etiology of hypoglycemic convulsions (Zubirán[70]), and (*e*) ovarian dysfunction, as in the case of hyperinsulinism of Weil,[49] in which a woman with very low blood sugar levels constantly and frequently had the symptoms of an insulin reaction between her catamenial periods, but had convulsions only just before and during menstruation.

PROGNOSIS

The prognosis of hyperinsulinism depends on the degree and character of the associated pancreatic lesion. It is good in the functional cases when an intelligent patient will carry out dietary instructions.

On account of the bulimia and the polyphagia that is pathognomonic of hyperinsulinism, obesity often results. Prolonged overfunction, with exhaustion, of the islet cells may be followed by hypo-insulinism (diabetes mellitus). Clinical evidences suggest that the patient with hyperinsulinism is a potential diabetic patient. I have had three diabetic patients with histories of unmistakable symptoms of hyperinsulinism before the symptoms of diabetes were observed. Therefore, early diagnosis and early dietary management may prevent the patient with mild or moderately severe hyperinsulinism from becoming diabetic; the clinician may thus aid in combating the increasing death rate from diabetes.[71]

Spontaneous recovery from the attacks of convulsions and unconsciousness due to hyperinsulinism usually takes place, but a number of deaths have been reported from hypoglycemic coma, in some of which unsuspected adenomas of the pancreas have been found at autopsy.

In the severe cases that cannot be controlled by dieting, the hope of cure is offered by surgery; i. e., partial resection of the pancreas, or removal of insuloma. Early diagnosis is important in neoplasms of the pancreas, because delayed surgery may result in the condition becoming inoperable.

TREATMENT

The problem of dieting in hyperinsulinism is much the same as in diabetes mellitus (hypo-insulinism) in that each patient has to be dieted to suit his particular needs. It is necessary to arrange a diet that will nourish the patient properly, providing sufficient amounts of carbohydrates, proteins and fats, with due consideration to its vitamin content. As far as the quantity is concerned, it should have a lower carbohydrate content than in diabetes, with sufficient calories from fats to maintain normal body weight and physical vigor. The protein content depends on the age and weight of the individual, from 60 to 75 Gm. for an adult weighing 70 Kg. (154 pounds).

The adult patient of average height and weight with hyperinsulinism should have about 2,250 calories, from 90 to 120 Gm. of carbohydrates, from 60 to 75 Gm. of proteins and the remainder in fats (cream and butter), divided into from five to seven feedings a day.

In the underweight, asthenic patient with hyperinsulinism, a high fat diet of 90 Gm. of carbohydrate, from 200 to 300 Gm. of fat, and from 60 to 75 Gm. of protein, divided into five or six feedings a day, will keep the blood sugar at a sufficiently high level to prevent hypoglycemic symptoms and will build up the patient's general health and state of nutrition.

Careful blood sugar studies should be made on each patient for a few days after being placed on a diet for hyperinsulinism, during which time his food should be weighed and measured. It is just as necessary to teach the patient with hyperinsulinism food values and to calculate and arrange the menus suited to his particular case, as it is to teach "diabetic arithmetic" to patients with hypo-insulinism (diabetes mellitus).

Highland Avenue at Sycamore Street.

69. Wilder, Josef: A New Hypophysis Disease Picture: Hypophyseal Spontaneous Hypoglycemia, Deutsche Ztschr. f. Nervenh. **112**: 192-250, 1930.
70. Zubirán, S.: A Case of Hypoglycemia, Medicina, Mexico **9**: 306-310 (April) 1929.
71. Harris, Seale: Combating the Increasing Death Rate from Diabetes, Mississippi Doctor 20-24 (March) 1933.

ABSTRACT OF DISCUSSION

DR. RUSSELL M. WILDER, Rochester, Minn.: This subject has interested me greatly since I had the opportunity, with Allan, Power and Robertson, to study the case of island carcinoma to which Dr. Harris has referred. The existence of a state of hyperinsulinism was definitely proved in that case by obtaining insulin-like extracts from the hepatic metastases of the tumor. The report of this observation has been followed by a number of other reports of similar cases. In some of these, island tumors have been found and the resection of them has resulted in the complete relief of the syndrome of hypoglycemia. In others, no tumors were discovered. Reviewing the subject recently (*Internat. Clin.* **2**:1 [June] 1933) I was able to cite sixteen cases presenting tumors of the islands of Langerhans. Fourteen had been associated with symptoms of hypoglycemia; nine were diagnosed clinically and treated surgically. Multiple tumors were present in a case reported by Franck, in one reported by Smith and Seibel, and in one of the cases at the Mayo Clinic. In five additional cases of hypoglycemia, hypertrophy of the islands had been noted; but such hypertrophy is frequently seen when there is no evidence of excessive insulin production. In seven other cases of hypoglycemia, two examined at autopsy and five at surgical operations, the pancreas appeared to be normal. Information is thus available concerning twenty-nine cases of this hypoglycemia syndrome in which the opportunity has been given to examine the pancreas. Tumors were noted in only fifteen of them. The clinical differentiation between cases with and those without tumor has been for us impossible. The severity of the symptoms has been great in both groups of cases. The dextrose tolerance test has not been helpful. Extreme degrees of variation in the height of the blood sugar curve and in the rapidity and degree of its descent have been seen in both groups of cases. Dr. Harris suggests that patients with hyperinsulinism may be potentially diabetic and that diabetes may follow a period of hyperinsulinism. We have seen the reverse of this in two cases—diabetes first and hypoglycemia later. I am not entirely prepared to accept the idea of a faulty pancreas in those cases of hypoglycemia which present no neoplasm. It is true that typical diabetes mellitus is not infrequently seen with no morphologic abnormality of the pancreas. By analogy, hyperfunction of the islands of Langerhans might be expected even in the absence of their anatomic alteration. However, hyperglycemia, as contrasted to true diabetes mellitus, can be produced by a variety of disturbances without any evident involvement of the pancreas, and similarly hypoglycemia may be brought about by a variety of causes. Dr. Harris in 1923 happily suggested the possibility of the clinical state of hyperinsulinism, but the diagnosis of his early cases, those on which he based his suggestion, was substantiated only by the fact that the blood sugar was low and that food gave relief. There was no proof of an excess of insulin. Cammidge, observing similar cases about the same time, inferred with equal reasonableness that the liver was responsible. The organ chiefly concerned with the regulation of the blood sugar is the liver, and the secretion of the pancreas is only one of various factors that influence its ability to handle sugar. Recent observations indicate that similar quanta of insulin have different effects under differing conditions. I refer particularly to the extreme insulin sensitiveness of hypophysectomized animals (Barnes). Similar insulin sensitiveness has been produced experimentally by thyroidectomy, by denervation of the suprarenal capsules and by splanchnec-

tomy (de Takáts). Our knowledge, then, is still too fragmentary to accept the assumption of an excessive insulin production merely on the basis of hypoglycemia. Particularly is this true in the rather numerous cases presenting milder degrees of what Dr. Harris calls hyperinsulinism. A pertinent discussion of this matter appears from the pen of the editor of the May issue of the *Annals of Internal Medicine*. The present evidence, as stated in this editorial, seems to indicate that tumor of the islands is among the rarest causes of hypoglycemia, and for the present it would seem more in accordance with our actual lack of knowledge to designate all cases of hypoglycemia in which no definite proof of cause exists as spontaneous or idiopathic hypoglycemia rather than as hyperinsulinism.

DR. HENRY J. JOHN, Cleveland: While hypoglycemia, with its classic symptomatology, is the outstanding manifestation of hyperinsulinism, many persons in perfect health have marked hypoglycemia and no symptoms. Hyperinsulinism is not merely hypoglycemia. I feel, as Dr. Wilder does, that there is some other factor of importance. There are two types of hyperinsulinism, the exogenous and the endogenous. Years ago I published reports of two cases presenting the exogenous type of hyperinsulinism. Both patients had glycosuria and hyperthyroidism, but neither of them had diabetes. Their treatment at home had consisted of large doses of insulin, which had produced the classic hypoglycemic symptoms. In endogenous hyperinsulinism there is hyperfunction of the islands themselves or else an adenoma which either secretes too much insulin or stimulates the islands to secrete an excess of insulin. The treatment for hyperinsulinism has progressed through various phases. The first and most obvious method of relief was learned from the patients themselves. Even before the condition was known as an entity, the patients had learned that the ingestion of carbohydrates relieved them. When hyperinsulinism was definitely recognized as such, the problem presented was just the opposite of that encountered in diabetes, and so frequent carbohydrate feedings and an extra feeding at bedtime were administered to these patients. It was not the ideal treatment, because the excessive carbohydrate was continually stimulating the pancreas to produce more and more insulin, the very condition that the treatment was supposed to combat. The next step was to modify the diet, giving the patient less carbohydrate and more fat, in order to retard absorption of the carbohydrate and the resultant hyperglycemia and thus to eliminate the acute stimulation of insulin production and hypoglycemia. A third method of treatment was surgical removal of a portion of the pancreas, in order to reduce the number of secreting islands in an effort to decrease the excessive production of insulin. Another step in the treatment of hyperinsulinism is the administration of insulin, which I have tried recently with exceptionally good results in one case. The rationale for this method of treatment is briefly as follows: The ingestion of food produces hyperglycemia, which in turn stimulates the insulogenic apparatus to insulin secretion, and this is followed by a drop in the level of blood sugar. In normal persons the intake of dextrose and the secretion of insulin are nicely balanced, but in patients with diabetes or with hyperinsulinism there is some defect in the mechanism in one or the other direction.

DR. GÉZA DE TAKÁTS, Chicago: During the past few years an attempt has been made to produce an increased secretion of insulin in the dog by producing a hypertrophy and hyperplasia of the islet tissue. This was found to be possible in the animal and to a certain extent also in the human juvenile diabetic patient. One may find, however, in the cases of hyperinsulinism not only an excessive insulin secretion but also an increased sensitivity to insulin. Tests for insulin susceptibility have not been determined frequently enough in patients with diabetes but on the basis of a few well observed cases it can be said that there is a wide variation in the individual with diabetes and also in the so-called normal individual as to susceptibility to insulin. It is quite possible, then, that some of these patients with spontaneous hypoglycemia do not actually secrete an excessive amount of insulin, but they become, because of nervous or glandular mechanisms, temporarily sensitive to insulin. Thus it is known that epinephrine insufficiency and pituitary insufficiency will produce a hypersensitivity to insulin. Splanchnic section in diabetic patients also increases insulin sensitivity. From the surgical standpoint the attack on the pancreas is not any more dangerous than any upper abdominal operation on the well controlled patient. I should like to emphasize, contrary to the usual opinion, that the danger of pancreatic necrosis is very slight. Pancreatic secretion is inactive in the pancreas, and an aseptic operation will not activate the pancreatic ferments. As a matter of fact, the cases reported in which the adenoma of the pancreas has been removed show that there was not one single instance of postoperative pancreatic necrosis.

DR. SEALE HARRIS, Birmingham, Ala.: I am sorry that I didn't have the time to discuss the diagnosis of hyperinsulinism in the fifteen minutes allowed for presenting a paper. In my paper I stress the fact that a positive diagnosis of hyperinsulinism can be made only from repeated fasting blood sugar studies and carbohydrate tolerance tests showing hypoglycemia, namely, a blood sugar concentration below 70, and by excluding all other causes of hypoglycemia except the excessive secretion of insulin by the islet cells of the pancreas. It is not possible at times to exclude all the other causes of hypoglycemia except hyperinsulinism, any more than can be done in making a diagnosis of diabetes from hyperglycemia and glycosuria. It seems likely that there are many mild cases of hyperinsulinism just as there are mild cases of diabetes; and I think that hyperinsulinism occurs perhaps as frequently as hypo-insulinism (diabetes mellitus), the opposite secretory disturbance of the islet cells of the pancreas. Hypoglycemia may be due to deficient glycogenesis. A number of cases of hypoglycemia have been reported as resulting from massive tumor of the liver. Inadequate mobilization of glycogen due to deficient secretion of the suprarenals is also a cause of hypoglycemia, as in the case reported by Anderson, in which there was marked hypoglycemia and the autopsy revealed an adenoma of the left suprarenal gland. Hypoglycemia may be due to thyroid dysfunction, and to hypophyseal dysfunction, as Cushing has pointed out. There are other causes of hypoglycemia. The important thing in making a diagnosis of hyperinsulinism is to study the cases carefully and to come to an accurate diagnosis from repeated blood sugar studies, excluding all other causes of hypoglycemia except the excessive secretion of insulin by the islet cells of the pancreas. One can guess pretty definitely in the mild cases of hyperinsulinism from such clinical symptoms as hunger, weakness, nervousness and distress three or four hours after eating, which are relieved by taking food, that one is dealing with hypoglycemia; and a very large proportion of such cases are due to an excessve secretion of insulin by the islet cells. Of course, one should not stop at symptoms but should study the cases carefully, making blood sugar studies and eliminating all other factors in hypoglycemia, except the excessive secretion of the islet cells of the pancreas, before a positive diagnosis of hyperinsulinism is made.

Coughs.—I would particularly ask your attention to coughs. . . . There is the revolting, hawking, morning, pharyngeal cough of chronic pharyngitis best manifest in the alcoholic. There are the annoying habit coughs of children which cause no harm excepting to the inexperienced mother; the painful, voiceless coughs of grave laryngeal disease; the brassy cough of thoracic aneurysm; and the phthisical cough, which I find difficult to describe, although it has quite definite features of its own. It is not so effortful but, in late cases, as productive as the bronchitic cough; being less tenacious, the sputum is more easily ejected; the cough is moister and unattended by rhonchus; in the very advanced case it may have a hollow, weary quality. We have also the unmistakable paroxysm of whooping cough, with its repeated expiratory efforts, usually (but not always) culminating in the final inspiratory stridor. How often I have pricked up my ears during a ward round and caught the eye of my house physician in relation to his latest unsuspected admission as "bronchitis" to one of the cots. I used the adjective "unmistakable" in connection with the cough of pertussis, but it is worth remembering that a foreign body in the bronchus or a small undischarged pulmonary abscess may give rise to severe and prolonged paroxysms of coughing which are not very dissimilar.—Ryle, J. A.: The Training and Use of the Senses in Clinical Work, *Guy's Hosp. Gaz.* **47**:421 (Oct. 28) 1933.

Clinical Notes, Suggestions and New Instruments

URTICARIA OF SEVENTEEN YEARS' DURATION: REPORT OF CASE TREATED SUCCESSFULLY

JOHN L. EMMETT, M.D., AND ARCH H. LOGAN, M.D., ROCHESTER, MINN.

Urticaria is often one of the most discouraging problems the physician is called on to treat. Although definitely associated with the great allergic triad hay fever, eczema and urticaria, it often defies all attempts to identify the sensitizing factor. Such diagnoses as physical allergy and allergy produced by products of metabolism are often resorted to. The case here presented is one that had defeated all attempts to identify the exciting cause and had finally been considered a case of physical allergy with a large nervous element.

REPORT OF CASE

A white woman, aged 30, single, entered the Mayo Clinic, Aug. 29, 1932, complaining of a heat rash that had been present since puberty. The rash was brought on by any exertion and also by wind and cold weather. The disability became so great that the patient had been forced to abstain from activities enjoyed by normal girls; she could not attend dances, could not swim, could barely walk enough to attend school. The rash would be brought on several times daily and could be made to disappear only by the patient sitting perfectly still for from forty-five minutes to three hours. It was present the year round but was more severe in winter. The eruption consisted, in its mild phase, of a scarlet flush, soon followed by a red, diffuse, papular eruption; it usually was confined to the neck, face and arms, and it itched and burned excessively. If the patient did not become quiet immediately, the condition became worse; more of the body became involved; large, typical, urticarial wheals appeared; the hands and wrists became swollen often enough to prevent closing the fists; the lips became swollen, and edema of the larynx would often produce some wheezing and a choking sensation. At this stage moderate dermographia could be elicited. The disability, coming as it did in adolescence and young adult life, caused the patient to become very self conscious and easily embarrassed when in the company of others, and embarrassment often would excite an eruption. The patient's father was a physician, and many treatments had been tried and many attempts made to determine the exciting factor, but without success. Skin tests had all been negative. Elimination diets to seek out offending foods disclosed none to be the cause. Basal metabolic rates had been normal. Examination for foci of infection had all been negative. Many drugs had been tried without success. A few months previous to her admission at the clinic she had been given some Soricin (sodium ricinoleate) 5 grains (0.3 Gm.) three times a day, as advocated recently by Morris and Dorst,[1] to overcome bacterial sensitivity of the intestinal tract. For two or three weeks this treatment had seemed to help some, but it soon failed to give any relief. The patient's father had been subject to hay fever, but other than this the family history was negative.

At examination the young woman was found to be rather obese. Over the neck and face there was a mild, papular eruption that had appeared after a short walk to the clinic. Two teeth were dead, although there was no evidence of periapical infection. The tonsils had been removed, but there was a small tonsillar tag on the left. Urinalysis, blood counts and differential blood counts all gave normal results. The serologic test for syphilis, performed on the blood, was negative. The basal metabolic rate was —8 per cent. Blood pressure and pulse rates were normal. Puberty had occurred at the age of 13 years. Menstruation had occurred every four to six weeks, except for the two years just preceding her visit to the clinic, when flow had become regular at thirty-three days but was rather scant. She had had considerable dysmenorrhea since puberty. Skin tests with a wide variety of substances all gave negative results. Attempts to produce urticarial wheals by means of physical agents such as heat, cold and light resulted in a small wheal being produced with ice. None of the other agents caused any reaction.

Because of the fact that Soricin had seemed to give slight, temporary relief, and in spite of the fact that the patient had never had any intestinal symptoms (not even mild constipation), a culture was made of her stool and the predominating organisms were isolated. The standard bacteriologic procedure was employed, fishing the colonies from poured blood agar plates, and subsequently growing them as pure cultures in brain broth. Killed suspensions of the organisms, made up to a concentration of 500,000,000 in each cubic centimeter, were used for skin tests. Four organisms were isolated: streptococci that caused slight hemolysis, green-producing streptococci, Escherichia coli that was indifferent on blood agar, and Escherichia coli that was hemolytic.

Skin tests made on the volar surface of the left forearm with killed suspensions of these organisms resulted in no reaction from the streptococci but reaction graded 3 at the sites of injection of both suspensions of Escherichia coli. The reactions consisted of large urticarial wheals surrounded by larger areas of erythema. There was no reaction at the site of the control injection of physiologic sodium chloride solution. A vaccine was made of equal parts of the two suspensions of Escherichia coli.

During the time required to produce the vaccine, the patient was given five subcutaneous injections daily of 0.1 mg. of histamine, in an effort to determine whether desensitization by histamine could be produced as Horton and Brown[2] had produced it in their work with cold allergy. This did not relieve the symptoms and was discontinued.

The patient was dismissed from the clinic, September 15, to begin the treatment by vaccine at home. She was instructed to begin with 0.1 cc. taken subcutaneously twice weekly, increasing the dose by 0.1 cc. each time unless a local reaction occurred. If such reaction did occur, the dose was to be dropped and gradually increased again. A dose of 1 cc. was to be the maximum. The patient found that she never could exceed a dose of 0.6 cc., as a larger dose produced a large area of redness and swelling at the site of injection.

Within three weeks after she began the treatment with vaccine the patient's condition was markedly improved, and by the end of six weeks the urticaria had completely disappeared. She could walk and exercise with impunity for the first time since she had reached the age of 13 years. She gradually assumed the routine of taking 0.6 cc. of vaccine once weekly. About the last day of the week, if she exerted herself, she would notice a little blush on her neck, suggestive of the old eruption, but it would leave immediately when she rested, and injection of the vaccine the next day would keep her completely relieved for the next six or seven days. In June, 1933, she was advised to discontinue taking the vaccine. She did this for two weeks, but the eruption began to return and she resumed the treatment. At present she is still taking the vaccine once weekly, with complete relief of symptoms, which makes almost one year of complete relief since the treatment was begun.

COMMENT

No attempt will be made here to explain this result. It will be interesting to trace the patient and see whether the relief is permanent, as it bids fair to be after a year of relief. At any rate, the treatment involves practically no risk, is not expensive, and may well be tried in stubborn cases, when the exciting factor seems obscure.

From the Mayo Clinic. Dr. Emmett is a Fellow in Surgery of the Mayo Foundation, and Dr. Logan is connected with the Division of Medicine of the Mayo Clinic.

1. Morris, R. S., and Dorst, S. E.: The Use of Sodium Ricinoleate in Bacterial Hypersensitiveness of the Intestinal Tract: Clinical Results, Ann. Int. Med. **4**: 396-397 (Oct.) 1930. Dorst, S. E., and Morris, R. S.: Bacterial Hypersensitivity of the Intestinal Tract: Its Treatment with Autogenous Vaccine and Sodium Ricinoleate, Am. J. M. Sc. **180**: 650-656 (Nov.) 1930.

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Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

H. A. CARTER, Secretary.

VICTOR ULTRAVIOLET MERCURY VAPOR QUARTZ LAMPS ACCEPTABLE

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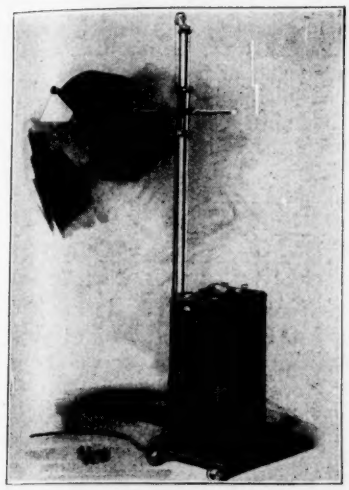

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Model "A" Mobile Unit, with receptor for lamp counterweight suspended from curved overhead arm on rectifier control stand. 115 or 230 volts, 50-60 cycles. Approximate shipping weight, 275 lbs. (125 Kg.)

WATER-COOLED—FAUCET TYPE

Model "A" Mobile Unit, with receptor for lamp mounted on rectifier control cabinet; includes necessary attachments for plumbing connections. 115 or 230 volts, 50-60 cycles. Approximate shipping weight, 180 lbs. (82 Kg.)

Model "A" Mobile Unit, with receptor for lamp counterweight suspended from curved overhead arm; includes necessary attachments for plumbing connections. 115 or 230 volts, 50-60 cycles. Approximate shipping weight, 235 lbs. (107 Kg.)

Model "B" Wall Unit, with hinged receptor for lamp mounted on wall; includes wall bracket for control cabinet and necessary attachments for plumbing connections. 115 or 230 volts, 50-60 cycles. Approximate shipping weight, 140 lbs. (64 Kg.)

COMBINATION OUTFITS

Model "A" Mobile Unit, with self-contained water-cooling system combining air-cooled lamp with water-cooled lamp. Air-cooled reflector hood and receptor for water-cooled lamp mounted on rectifier control cabinet. 115 or 230 volts, 50-60 cycles. Approximate shipping weight, 295 lbs. (134 Kg.)

Model "A" Mobile Unit with faucet water-cooling system, combining air-cooled lamp with water-cooled lamp. Air-cooled reflector hood and receptor for water-cooled lamp mounted on rectifier control cabinet. Includes necessary attachments for plumbing connections. 115 or 230 volts, 50-60 cycles. Approximate shipping weight 255 lbs. (116 Kg.)

Model "B" Mobile Unit with faucet water-cooling system, combining water-cooled lamp with air-cooled lamp. Air-cooled reflector hood and rectifier control mounted on tripod base; water-cooled lamp on hinged wall receptor. Includes necessary attachments for plumbing connections. 115 or 230 volts, 50-60 cycles. Approximate shipping weight 250 lbs. (114 Kg.)

The firm writes that the outfits listed above are inclusive of Uviarc Quartz Tubes and Tungar Rectifier Bulbs (when required). While model A units are obtainable for operation on 25-49 cycle alternating current, order should so specify, as special wiring is required for these frequencies.

DIRECT CURRENT UNITS—AIR-COOLED

Model "B" Mobile Unit, with control cabinet and tubular column for reflecting hood mounted on tripod base. 110 or 230 volts. Approximate shipping weight, 190 lbs. (86 Kg.)

Model "B" Ceiling Suspension Unit, reflecting hood suspended from ceiling; control cabinet mounted on wall bracket. Includes wall bracket for control cabinet; does not include suspension pipe or ceiling socket. 110 or 220 volts. Approximate shipping weight, 130 lbs. (59 Kg.)

Model "D" Mobile Unit, with telescopic column for reflecting hood and transformer-base mounted on four casters. 110 or 220 volts. Approximate shipping weight, 93 lbs. (42 Kg.)

WATER-COOLED—SELF-CONTAINED

Model "A" Mobile Unit, with receptor for lamp mounted on control cabinet. 110 or 220 volts. Approximate shipping weight, 190 lbs. (86 Kg.)

Model "A" Mobile Unit, with receptor for lamp counterweight suspended from curved overhead arm on control stand. 110 or 220 volts. Approximate shipping weight, 245 lbs. (111 Kg.)

WATER-COOLED—FAUCET TYPE

Model "B" Wall Unit, with hinged receptor for lamp mounted on wall; includes wall bracket for control cabinet and necessary attachments for plumbing connections. 110 or 220 volts. Approximate shipping weight, 110 lbs. (50 Kg.)

COMBINATION OUTFITS

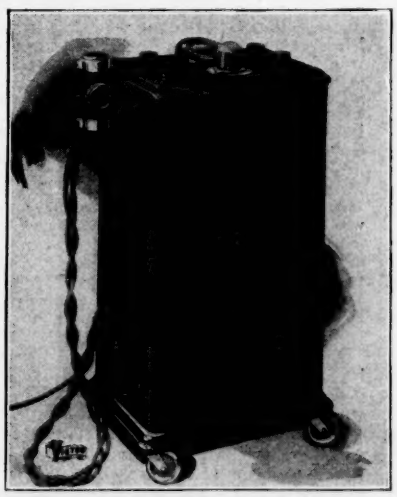
Model "A" Mobile Unit with self-contained water-cooling system, combining air-cooled lamp with water-cooled lamp. Air-cooled reflector hood and receptor for water-cooled lamp mounted on control cabinet. 110 or 220 volts. Approximate shipping weight, 265 lbs. (120 Kg.)

Model "B" Mobile Unit with faucet water-cooling system, combining water-cooled lamp with air-cooled lamp. Air-cooled reflector hood and control cabinet mounted on tripod base; water-cooled lamp on hinged wall receptor. Includes necessary attachments for plumbing connections. 110 or 220 volts. Approximate shipping weight 220 lbs. (110 Kg.)

The Council has investigated several of these ultraviolet radiation generators, both of the air-cooled and water-cooled type, and has found the mechanical make-up and physical characteristics of them satisfactory.

The General Electric Air-Cooled Mercury Vapor Arc Lamps, model A, can be operated on an arc voltage of from 70 to as high as 90. The current consumption, when operated on 70 volts, is 3½ amperes. As the arc voltage is raised to 90 there is no appreciable increase in the current, remaining practically constant at 3½ amperes.

The model B Air-Cooled Mercury Vapor Arc Lamps can be operated on an arc voltage of from 70 to 80, the current consumption being 3½ amperes.



Model "A" Water-Cooled Quartz Lamp

In the case of the air-cooled lamps, the time for a first degree erythema on an average skin, at a distance of 30 inches, is on the average 30 to 45 seconds, when operating on an arc voltage of 70. If, for example, the arc voltage of the model A lamp is raised to 90, it will produce a first degree erythema on an average skin at a distance of 30 inches in approximately 15 to 30 seconds.

The General Electric Water-Cooled Quartz Mercury Lamps are designed to operate on an arc voltage of 50, the current consumption at this voltage being approximately 3.3 amperes.

A minimum perceptible erythema may be produced on contact with the average skin in about fifteen seconds.

The Council on Physical Therapy declares the ultraviolet generators, manufactured by the General Electric X-Ray Corporation, eligible for inclusion in the list of accepted devices.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENT.

PAUL NICHOLAS LEECH, Secretary.

ANTIPNEUMOCOCCUS SERUM CONTAINING TYPE II ANTIBODIES

In 1924 the Council omitted all antipneumococcus serums containing type II antibodies, on the ground that the therapeutic efficacy of this organism had not been demonstrated. Preparations containing type I antibodies have been retained since that time. Recently there has been brought to the Council's attention evidence that with improved preparations and technic the experimental use of type II antibodies or of preparations containing this antibody in combination with type I is justified. The Council therefore voted to consider the acceptance of brands of antipneumococcus serum containing type II and voted to inform firms manufacturing the antipneumococcus serum of this decision.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

ANTIPNEUMOCOCCUS SERUM (See New and Nonofficial Remedies, 1933, p. 369.

Lederle Laboratories, Inc., Pearl River, New York.

Antipneumococcic Serum, Refined and Concentrated, Types I and II.—Prepared by immunizing horses with intravenous injections of cultures of type I and type II pneumococci. When test bleedings show the serum to have reached a sufficient degree of potency for types I and II pneumococci, the horses are bled aseptically and the serum is refined and concentrated by the method described by Lloyd D. Felton (*J. Infect. Dis.*, December, 1928, p. 543). The usual sterility and safety tests are made by injection into white mice and guinea-pigs. The potency of the product is expressed in terms of the unit described by Felton (*Boston M. & S. J.*, May 15, 1924, p. 819; *J. Infect. Dis.*, September, 1925, p. 199; October, 1925, p. 309) and used by Park. While the unit originally was intended to be the amount of antibody that will protect against one million fatal doses of culture, it has lately been taken to be 1/200 cc. of the control serum (F 146) distributed by Dr. Felton. Marketed in packages of one syringe containing 10,000 units each of types I and II, and in packages of one syringe containing 20,000 units each of types I and II, each accompanied by a vial of normal horse serum (1:10 dilution) for the conjunctival test.

Dosage.—Intravenously, first dose, 10,000 units of each type, followed by a second dose of 20,000 units of each type in one hour; the second dose may be repeated at intervals of from four to six hours until the temperature falls and beneficial effects are evident.

Antipneumococcic Serum, Refined and Concentrated, Type II.—Prepared by immunizing horses with intravenous injections of cultures of type I and type II pneumococcus. When test bleedings show the serum to have reached a sufficient degree of potency for type II pneumococcus, the horses are bled aseptically and the serum is refined and concentrated by the method described by Lloyd D. Felton (*J. Infect. Dis.* **43:** 543 [Dec.] 1928). The usual sterility and safety tests are made by injection into white mice and guinea-pigs. The potency of the product is expressed in terms of the units described by Felton (*Boston M. & S. J.* **190:** 819 [May 15] 1924; *J. Infect. Dis.* **37:** 199 [Sept.] 1925; **37:** 309 [Oct.] 1925) and used by Park. While the unit originally was intended to be the amount of antibody that will protect against one million fatal doses of culture, it has lately been taken to be 1/200 cc. of the control serum (F 146) distributed by Dr. Felton. Marketed in packages of one syringe containing 10,000 units and in packages of one syringe containing 20,000 units, each accompanied by a vial of normal horse serum (1:10 dilution) for the conjunctival test.

Dosage.—Intravenously, first dose, 10,000 units, followed by a second dose of 20,000 units, in one hour; the second dose is repeated at intervals of three to four hours until the temperature falls and beneficial effects are evident.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

RAYMOND HERTWIG, Secretary.

NOT ACCEPTABLE

GENUINE BUTTER-NUT BREAD (SLICED)

The L. D. Feuchtenberger Bakeries, Bluefield, W. Va., submitted to the Committee on Foods a white bread called "Genuine Butter-Nut Bread (Sliced)" composed of patent flour, water, sweetened condensed skimmed milk, sucrose, lard, salt, malt syrup, yeast and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate.

Discussion of Name.—The name "Butter-Nut Bread" implies that the bread contains either butter and nuts or butternuts and in such quantity as to give the product distinctive physical and nutritional characteristics because of such ingredients and different from those of customary white bread. The baking formula does not contain butter, nuts or butternuts. The name is considered inappropriate, misinformative and misleading.

The manufacturer, when informed of this opinion, expressed himself as unwilling to change the name in accordance with the Committee's recommendations. This bread will therefore not be listed among the Committee's accepted foods.

NOT ACCEPTABLE

DR. BROOKS' CACAO LIQUOR

The Beacon-Gale Corporation, New York, submitted to the Committee on Foods a cacao liquor or chocolate called "Dr. Brooks' Cacao Liquor."

Discussion of Name.—Food names containing the name of a doctor or including the title "Dr." lend themselves to misleading medicinal, quasimedicinal or therapeutic advertising. The names suggest medicinal uses or therapeutic values for the food. Advertising copy writers are prone to take advantage of such names and at least give medicinal implications to the advertising. Since such names are strong incentives to inappropriate advertising, their use for foods is to be discouraged. An appropriate name for this chocolate liquor is "Brooks' Chocolate Liquor."

The manufacturer was informed of this opinion but has expressed himself as unwilling to change the name in accordance with the Committee's recommendations. This product will therefore not be listed among the Committee's accepted foods.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

McCORMICK'S BEE BRAND VANILLA EXTRACT

Manufacturer.—McCormick & Company, Inc., Baltimore.

Description.—Vanilla extract containing water, alcohol, sugar, and extractive matter of Mexican vanilla beans.

Manufacture.—Mexican vanilla beans are warmed in an oven or in the sun and are packed in cases wrapped in blankets or matting, to induce "sweating" or fermentation. After a definite period the beans, while still warm, are removed from the cases and dried on frames in the sun. This procedure of alternate sweating and drying is repeated many times to develop the desired flavor, taking from four to six months. The beans become dark and lose moisture during the treatment. They are exported in wooden cases.

For preparing the extract at the American plant the beans are chopped, macerated in a menstruum of 95 per cent alcohol, water and sugar, and then percolated with the same solution; the extract is stored for from six to twelve months, filtered, and bottled.

Analysis (submitted by manufacturer).—

	per cent	
Water, by volume	57.3	
Alcohol, by volume	42.1	
Total solids	8.0	Gm. per 100 cc.
Ash	0.4	Gm. per 100 cc.
Sucrose	4.9	Gm. per 100 cc.
Vanillin	0.24	Gm. per 100 cc.
Lead number (Winton)	0.67	

Claims of Manufacturer.—Conforms to definition and standard for vanilla extract of the United States Department of Agriculture.

BEECH-NUT STRAINED GREEN BEANS
(SLIGHTLY SEASONED WITH SALT)

Manufacturer.—Beech-Nut Packing Company, Canajoharie, N. Y.

Description.—Sieved green beans retaining in high degree the natural vitamin and mineral values; seasoned with salt.

Manufacture.—Fresh green beans are thoroughly washed and cleaned; stem and blossom ends are removed by hand. The subsequent treatment and processing are the same as for Beech-Nut Strained Carrots (THE JOURNAL, Nov. 11, 1933, p. 1562).

Analysis (submitted by manufacturer).—

	per cent
Moisture	93.5
Total solids	6.5
Ash	1.4
Sodium chloride	0.5
Fat (ether extract)	0.1
Protein (N × 6.25)	1.1
Crude fiber	1.1
Carbohydrates other than crude fiber (by difference)	2.8

Calories.—0.2 per gram; 5.7 per ounce.

Vitamins and Claims of Manufacturer.—See Beech-Nut Strained Carrots (THE JOURNAL, Nov. 11, 1933, p. 1562).

FFOG BRAND EVAPORATED MILK

Packer.—The Page Milk Company, Merrill, Wis.

Distributor.—Ridenour Baker Grocery Company, Kansas City, Mo.

Description.—Canned, unsweetened evaporated milk, the same as Page Evaporated Milk Sterilized Unsweetened (THE JOURNAL, May 30, 1931, p. 1872).

1. FANT'S FAMOUS FLOUR (MATURED, BLEACHED)
2. X-CEL FLOUR (MATURED, BLEACHED)

Manufacturer.—Fant Milling Company, Sherman, Texas.

Description.—1. "Long patent" hard wheat flour; bleached. 2. "Long patent" flour prepared from soft and hard wheats; bleached.

Manufacture.—Selected wheat is cleaned, scoured, tempered and milled by essentially the same procedures as described in THE JOURNAL, June 18, 1932, p. 2210. Chosen flour streams are blended and bleached with nitrogen trichloride (from 1.5 to 3 Gm. per barrel) and with benzoyl peroxide and calcium phosphate (1 part to 50,000 parts of flour) and automatically packed in bags.

Claims of Manufacturer.—"All purpose" flours for home baking.

I. G. A. GOLDEN TABLE SYRUP
(CORN SYRUP FLAVORED WITH REFINERS' SYRUP)

Packer.—Wheeler-Barnes Company, Minneapolis.

Distributor.—Independent Grocers Alliance Distributing Company, Chicago.

Description.—Table syrup; corn syrup base (85 per cent) with refiners' syrup (15 per cent), the same as Golden Oak Brand Amber Syrup (THE JOURNAL, Dec. 3, 1932, p. 1948).

HIRES ROOT BEER CARBONATED BEVERAGE

Manufacturer.—The Charles E. Hires Company, Philadelphia.

Description.—Carbonated root beer extract beverage prepared under license by Charles E. Hires Company, containing carbonated water, sucrose, and "Hires Root Beer Extract" or "Hires Root Beer Extract Bottlers' Solution," which is similar in composition to "Hires Root Beer Concentrated Extract" excepting for the quantity of caramel ingredient (Hires Root Beer, THE JOURNAL, Aug. 13, 1932, p. 563).

Manufacture.—The carbonated beverage is prepared under license grants; the licensee is contracted to use the prescribed formula and method of preparation and advertising prepared under the direction of the Hires Company. That company makes a number of inspections each year of the licensees' plants and method of merchandising.

Analysis (submitted by manufacturer).—

	per cent
Moisture	89.6
Total solids	10.4
Ash	0.1
Fat (ether extract)	0.0
Protein (N × 6.25)	0.0
Sucrose (copper reduction method) (immediately after bottling)	9.3

Calories.—0.4 per gram; 11 per ounce.

Claims of Manufacturer.—A refreshing carbonated root beer extract beverage.

WEIDEMAN BOY BRAND TOMATO JUICE

Packer.—Vincennes Packing Corporation, Vincennes, Ind.

Distributor.—The Weideman Company, Cleveland.

Description.—Pasteurized tomato juice with added salt; retains in high degree the natural vitamin content; the same as Alice of Old Vincennes Tomato Juice (THE JOURNAL, Feb. 20, 1932, p. 640).

POSTUM

Manufacturer.—Postum Company, Inc., New York.

Description.—Roasted blend of bran, wheat, molasses and malted wheat flour.

Manufacture.—Bran, malted wheat flour and molasses are blended in definite proportions, roasted, admixed with roasted wheat, ground and automatically packed.

Analysis (submitted by manufacturer).—

	per cent
Moisture	1.0
Ash	5.9
Fat (ether extraction method)	2.7
Protein (N × 6.25)	12.3
Crude fiber	9.5
Carbohydrates other than crude fiber (by difference)	68.6

Calories.—3.5 per gram; 99 per ounce.

Claims of Manufacturer.—For the preparation of table beverage with water or milk. Contains no stimulating ingredient.

LILY CAREY-IZED TABLE SALT
PIONEER CAREY-IZED TABLE SALT
PREMIUM SIFTED CAREY-IZED TABLE SALT
1 PER CENT MAGNESIUM CARBONATE ADDED TO PREVENT CAKING

Manufacturer.—The Carey Salt Company, Hutchinson, Kan.

Description.—Table salt containing approximately 1 per cent added magnesium carbonate. The same as "Carey's Salt (Free Running)" (THE JOURNAL, Aug. 26, 1933, p. 676).

Claims of Manufacturer.—For table and cooking uses of salt. The added magnesium carbonate tends to preserve the "free running" qualities. Does not cake or harden in the package.

SWIFT'S STERILIZED EVAPORATED MILK

Packer.—Libby, McNeill & Libby, Chicago.

Distributor.—Swift and Company, Chicago.

Description.—Canned, unsweetened evaporated milk, the same as Libby's Sterilized Unsweetened Evaporated Milk (THE JOURNAL, June 13, 1931, p. 2037).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 16, 1933

THE HAZARDS OF DRY CLEANING

One of the innovations of modern life is the widespread use of dry cleaning. This involves the employment of a variety of organic substances (in contrast with the familiar cleansing soap and water) that act as solvents of stains and detergents for dirt. A number of hazards may attend the use of the newer "dry cleaning solvents." Most of them are quite volatile and many present fire hazards because of their explosive or inflammable character. From this point of view the danger of burns, which already besets mankind in increasing degree, is additionally multiplied. A second possibility of harm lies in the effects of some of the cleanser solvents on the skin of the hands. This applies particularly to dry cleaning in the home, where the immersion of garments by hand into the cleanser is part of the usual routine of use. A further menace resides in the toxicity of the vapors that are almost inevitably encountered where the cleansing solvents are used.

According to a recent study [1] of the problem of dry cleaning, particularly as it relates to the home, more than fifty solvents sold for the purpose of cleaning fabrics at home by immersion were found to consist of one or more of the following organic liquids: carbon tetrachloride, chloroform, trichlorethylene, ethylene dichloride, propylene dichloride, benzene, toluene, ether, alcohol and petroleum distillates of various degrees of volatility. This is a formidable list of "dangerous chemicals" for any physician to contemplate, and it at once conjures up risks to human well being in more than one way. From the point of view of fire underwriters' hazards, the following points are taken into consideration in each case: volatility, ignition temperature, flammable or explosive limits, combustion intensity, vapor density, toxicity, nature or products of combustion, and nature of products of decomposition on storage or heating. Some of the compounds used, notably carbon tetrachloride and trichlorethylene, are noncombustible and nonflammable. Unfortunately, some of the commercial proprietary products sold for the home are conspicuously labeled as nonexplosive. The report states that this is misleading to the housewife, who is likely to think that the term implies nonflammability. It is also incorrect in the strict sense of the word, since solvents of this type might explode under some circumstances. Various testing laboratories report petroleum distillates of this range as semiexplosive.

The underwriters' laboratories also mention that the toxicity of a substance is recognized as having an indirect bearing on the fire hazard involved in the use of the product. The reason given for this is that a toxic substance, by contact with the skin or through inhalation, may act on the body of the person using it in such a way as to incapacitate or drive him away, thereby introducing a serious hazard in case of fire. It is reported, further, that some of the secret mixtures advertised as nonexplosive are made of gasoline and a nonflammable chemical. A fault of these solvents is that the added chemicals evaporate more quickly during use than does the gasoline, which leaves the fluid practically nothing but gasoline. Experience shows that the promiscuous sale of motor fuel for home dry cleaning is not uncommon. The study points out that warnings are rarely given. The purchase of gasoline at a filling station may also involve a hazard other than fire—that of tetra-ethyl lead poisoning. Present methods of obtaining gasoline at filling stations make it possible for the purchaser to obtain gasoline containing tetra-ethyl lead without being aware of the presence of this ingredient. Since tetra-ethyl lead is one of the few compounds definitely known to be poisonous merely by absorption through the skin, the dangers of handling gasoline containing this substance (aside from the fire hazard) cannot be overestimated.

As far as the local effects of the cleaner solvents are concerned, all of them were found, as might be expected, to have the effect of removing oil from the skin, thus causing it to become chafed and cracked, particularly around the fingernails. The open vessel method caused much worse chafing than did the closed vessel method, although, even in the latter case, immersion of the hands in the solvent was found to be necessary in removing and squeezing the fabrics. There appeared to be little difference between the drying and chafing action of the various solvents on the hands. The effect of toxicity due to absorption of some of these compounds, notably in the form of vapors through the lungs, obviously varies under the diversity of conditions that may arise in the cleansing process. The amount of volatile ingredients reaching the respiratory tissues will depend on the degree of protection afforded by ventilation, the vaporizing potencies of the compound used, and the individual caution to avoid inhalation of "fumes." Such substances as naphtha and petroleum benzin, as well as other volatile petroleum distillates, may exert a baneful influence on the

1. Mack, Pauline B.; Kessinger, Polly B.; Ottinger, Elsa I., and Deck, Mary E.: Home Dry Cleaning Solvents, J. Home Economics **25**: 789 (Nov.) 1933.

nervous system;[2] and gasoline fumes cannot be endured long with impunity.[3] According to Mack and her co-workers,[1] the heavier petroleum distillates decrease in toxicity with a decrease in their volatility, although cases of skin lesions leading to acne and eczema are known to result from contact of these products with the skin over a long time. They assert that, aside from its acute effects, carbon tetrachloride is known to produce chronic ills in persons breathing only small quantities of its vapors through considerable periods. The compound appears to have a particularly deleterious effect on liver and kidney tissues, some of the latter of which cannot be rejuvenated, once destroyed. Just how large an amount of the solvent is needed or how many and how long the periods of inhalation must be in order to produce chronic hepatic and renal ailments, however, is not now known. All chlorinated hydrocarbons are known to have both acute and chronic deleterious effects on the human organism. Concerning the amounts of such compounds as ethylene dichloride, propylene dichloride, or trichlorethylene needed to become dangerous, even less is known than in the case of carbon tetrachloride. The toxicity of benzene and related compounds has long been familiar.

Dry cleaning, though still practiced extensively in the home, has become a public business of large magnitude in recent times. This seems to be a rather fortunate development. Industrial management is learning to consider the hazards to which the worker in plants is exposed, and in many instances the newer laws and other modes of regulation make imperative suitable precautions to protect those employed. In the home, on the other hand, there is less urge to guard against the menaces; and in many—perhaps most—instances there is no thought whatever of dangers well recognized in industrial plants. As evidence one may cite the appalling number of deaths from the inhalation of exhaust gases in garages attached to homes. Part of the lack of protection in the case of home dry cleaning solvents lies in the secret character of the vended products and the lack of adequate warnings on their labels. Probably the dangers will gradually become minimized by the growing abandonment of home cleaning in favor of commercial plants. The economic aspect of this change of practice will probably militate less and less against the latter. The recent study,[1] dealing as it did with the economy as well as the cleaning efficiencies of the various solvents, showed some unexpected outcomes. The cost of doing dry cleaning at home was found to be greater than is commonly supposed, and the cleaning efficiencies of the various solvents proved to be low. The retail prices of many of the secret preparations were found to be high as compared with the actual cost of their ingredients. It was found that many of the preparations had not been sent to a recognized laboratory to be examined for the fire hazard, and that even those which had been so examined did not carry on their labels a definite statement as to their degree of fire hazard. The presence of ingredients believed to be toxic even if handled in gallon quantities was revealed in many of the secret trade preparations. These were found in most cases to be accompanied by inadequate directions.

2. Hamilton, Alice: Industrial Poisons in the United States, New York, Macmillan Company, 1925, pp. 400-409.
3. Haggard, H. W.: The Anesthetic and Convulsant Effects of Gasoline Vapor, J. Pharmacol. & Exper. Therap. **16**: 401 (Dec.) 1920.

THE OUTLOOK IN NUTRITION

A survey of progress made in the science of nutrition during the past two decades serves to emphasize the tremendous sum total of effort expended by investigators in this field. Not only have many earlier observations been explained but unexpected relations have been established between nutrition and biologic function in lower forms of organisms as well as in man. Not the least of the accompanying phenomena is the widespread popular interest in nutrition, especially in some of its more novel features. A careful consideration of the broad scope and at the same time the logical detail of current knowledge of nutrition leads one to speculate on the direction which future effort will take in this field. In a recent discussion by Mendel [1] there has been brought to bear on this question the keen analysis and seasoned judgment of a pioneer investigator.

Attention is called to the influence, both direct and indirect, of the World War on nutrition. Not only were practical problems of the broadest scope presented for solution during that period, but before much time had elapsed it was acknowledged that the most valuable help came from those professionally trained in this field. Again, under the urge of national edicts the individual inevitably examined his personal dietary in the light of information which for the first time was by design made common property. The result of this large scale tutelage is a familiarity with at least some of the fundamental principles of nutrition on the part of a considerable portion of the population; food economics have been greatly influenced during the postwar period and individuals have not hesitated to alter their own dietary habits in order to conform to certain standards of physique or of alleged propriety.

Attention is further called by Mendel to the lack of current interest among investigators in what he calls "alimentation." By examining in detail a few of the accepted concepts regarding transformations in the gastro-intestinal tract, he points out the many uncertainties and actual gaps in the knowledge of secretion, digestion and absorption. For instance, "it must be frankly admitted that no adequate 'balance sheet' has ever been submitted for the disposal of digested and absorbed fat." There is likewise the suggestion that it would be profitable to reinvestigate the mode of entrance of the products of digestion of proteins into

1. Mendel, L. B.: Science **78**: 317 (Oct. 13) 1933.

the blood. Citing the recently demonstrated functions of the "trace" elements in nutrition, he directs emphasis toward the number of unusual, apparently adventitious, substances consumed by the individual, compounds occurring in plant and animal cells, the functions of most of which have as yet received scant attention.

In discussing the future of nutrition, the Yale investigator thus urges a reexamination of some of the fundamental tenets of the science, but in light of progress in thought as well as in increased precision of methods. This inevitably means a wider use of experimental animals supplemented with the best of microchemical technology.

FIBRINOLYTIC STREPTOCOCCI

Hemolytic streptococci of human origin are apparently unique among the pathogenic bacteria of clinical interest, since they invariably possess the property of rapidly dissolving or liquefying human fibrin. This lytic property may account in part for the ability of the streptococcus to invade tissues. A simple method for the determination of the fibrinolytic action of bacteria or of bacterial filtrates was developed by Tillett and Garner [1] of Johns Hopkins University School of Medicine. The technic consists in the addition of 0.5 cc. of a broth culture of the micro-organism to be tested to 1 cc. of 20 per cent oxalated human plasma. Coagulation is induced by the addition of 0.25 cc. of 0.25 per cent calcium chloride solution and the tubes are immediately placed in a water bath at 37.5 C. Slight fibrinolysis is shown by a softening and release of the clot from the sides of the tube. With complete lysis, all visible evidence of fibrin disappears from the mixture. Tubes in which the clot is still unsoftened and firmly adherent at the end of twenty-four hours are considered negative.

Twenty-eight strains of hemolytic streptococci of human origin were tested by the Baltimore physicians. These included strains isolated from scarlet fever, septicemia, erysipelas, tonsillitis, acute nephritis and otitis media. All these strains promptly and completely liquefied the routine human plasma clot, in most cases the lysis being complete within fifteen minutes. In no case was complete liquefaction delayed more than forty or fifty minutes. In contrast with this dramatic reaction, fifteen strains of hemolytic streptococci of nonhuman origin were completely nonfibrinolytic with their technic, a firm and apparently unaltered plasma clot being demonstrable at the end of twenty-four hours. These strains included streptococci isolated from the cow, horse, rabbit and guinea-pig. Three other animal strains, however, did give positive Tillett-Garner reactions. A large number of other bacterial species were also tested and invariably found to be fibrinolytically negative. These included such micro-organisms as Streptococcus viridans, Pneumococcus, B. typhosus, B. coli, B. dysenteriae and the influenza bacillus. The only other bacterial species thus far found to possess the Tillett-Garner lytic property were certain strains of the staphylococcus, which occasionally caused a slight softening of the human plasma clot if the reaction was allowed to continue for from eighteen to twenty-four hours.

The Tillett-Garner lytic action of hemolytic streptococci is at least relatively specific for human fibrin. No trace of clot liquefaction is demonstrable with rabbit fibrin. Other animal fibrins have not yet been tested. This observation is of basic interest in bacteriologic research. It suggests that many results of streptococcus research on rabbits, and possibly on other lower animals, are not applicable to human disease. The fibrinolytic agent formed by the clinically pathogenic hemolytic streptococcus is apparently a soluble enzyme or toxin, since it is demonstrable in apparently full titer in cell-free, sterile broth filtrates. An active antifibrinolytic immunity is demonstrable in the serum of patients who have recovered from acute hemolytic streptococcus infections. The possibility of a local therapeutic use of the Tillett-Garner lysin as an in vivo solvent of fibrinous exudates has not yet been tested. Whether or not antistreptococcus horse serum will neutralize the Tillett-Garner lytic factor has also not yet been determined.

1. Tillett, W. S., and Garner, R. L.: J. Exper. Med. **58**: 485 (Oct.) 1933.

Current Comment

PIMENTO PEPPERS AND VITAMIN A

The pimento pepper is now widely used as a condiment, especially in salads; the bright red flesh is decorative and adds a mildly piquant flavor to the food mixture. As a result of nutritional studies there has gradually developed a tacit assumption that highly colored natural food materials are likely to possess more or less unusual nutritive advantages. It is of particular interest, therefore, that Ascham [1] has recently demonstrated that the pimento pepper is rather prominent among vegetable products as a source of vitamin A. A few milligrams daily of the dried material suffices to promote excellent growth in experimental animals consuming a ration otherwise devoid of this factor. The vitamin potency of the dried fruit is of the order of magnitude of that of good cod liver oil and far above that of butter. In the form (canned) ordinarily used, pimentos are as rich in vitamin A as are carrots and somewhat richer than is butter. Expressing the vitamin A assay in conventional terms, somewhat less than 20 mg. of canned pimento contains approximately 1 unit. A determination of the carotene content of this variety of pepper indicated that 2 mg. of the dried material contained somewhat more than 0.5 microgram. As it has been previously shown that 0.5 microgram of carotene is roughly equivalent to 1 unit of vitamin A, it appears that virtually all the vitamin A

1. Ascham, L.: Bull. Georgia Expt. Sta. **177**, September, 1933.

potency of the pimento arises from the carotene contained in it. This agrees with other recent evaluations of fruits [2] and emphasizes a distinction, currently made, between the vitamin A potency of plant and of animal materials, that of the former being due largely to carotene whereas, in the latter, the pigment accounts for only a minor part of the vitamin A potency.[3]

Association News

MEDICAL BROADCAST FOR THE WEEK

Talk over Network of the National Broadcasting Company

The American Medical Association broadcasts each Monday afternoon from 1:30 to 1:45, Eastern standard time (12:30 central standard time). The subject for Monday, December 18, is "Have a Safe and Happy Christmas." The speaker will be Dr. W. W. Bauer, director, Bureau of Health and Public Instruction, American Medical Association. Subjects and speakers for subsequent broadcasts will be announced weekly in THE JOURNAL.

The following additional stations have signified their intention of accepting the program: WCAE, Pittsburgh; WFI, Philadelphia, and WCSH, Portland, Maine.

Radio Talks from Station WBBM

The American Medical Association broadcasts on Tuesday and Thursday mornings from 8:55 to 9 o'clock, central standard time, over Station WBBM (770 kilocycles, or 389.4 meters).

The subjects for the week are as follows:

December 19. Indigestion.
December 21. Your Nose—Inside and Out.

There is also a fifteen minute talk sponsored by the Association on Saturday morning from 9:45 to 10 o'clock over Station WBBM.

The subject for the week is as follows:

December 23. What Is a Mastoid?

THE CLEVELAND SESSION

Chairmen of Section Committees to Assist in Promotion of Section Exhibits

The fifteen sections of the Scientific Assembly have appointed exhibit committees to assist in the promotion of section exhibits at the Cleveland Session and in the coordination of activities between the Scientific Assembly and the Scientific Exhibit. Chairmen of the section exhibit committees are as follows:

PRACTICE OF MEDICINE:
Irving S. Wright, New York.

SURGERY, GENERAL AND ABDOMINAL:
Alton Ochsner, New Orleans.

OBSTETRICS, GYNECOLOGY AND ABDOMINAL SURGERY:
E. D. Plass, Iowa City.

OPHTHALMOLOGY:
Thomas D. Allen, Chicago.

LARYNGOLOGY, OTOLOGY AND RHINOLOGY:
William V. Mullin, Cleveland.

PEDIATRICS:
F. Thomas Mitchell, Memphis.

PHARMACOLOGY AND THERAPEUTICS:
Russell L. Haden, Cleveland.

PATHOLOGY AND PHYSIOLOGY:
W. C. MacCarty, Rochester, Minn.

NERVOUS AND MENTAL DISEASES:
Groves B. Smith, Godfrey, Ill.

DERMATOLOGY AND SYPHILOLOGY:
Fred D. Weidman, Philadelphia.

PREVENTIVE AND INDUSTRIAL MEDICINE AND PUBLIC HEALTH:
Paul A. Davis, Akron, Ohio.

UROLOGY:
Russell S. Ferguson, New York.

ORTHOPEDIC SURGERY:
E. B. Mumford, Indianapolis.

GASTRO-ENTEROLOGY AND PROCTOLOGY:
A. H. AARON, Buffalo.

RADIOLOGY:
S. W. Donaldson, Ann Arbor, Mich.

Application blanks for space in the Scientific Exhibit may be obtained from any of the foregoing chairmen or from the Director, Scientific Exhibit, 535 North Dearborn Street, Chicago.

2. Morgan, Agnes F., and Madsen, Evelyn O.: J. Nutrition **6**: 83 (Jan.) 1933.
3. Baumann, C. A., and Steenbock, Harry: J. Biol. Chem. **101**: 547 (July) 1933. Shrewsbury, C. L., and Kraybill, H. R., ibid. **101**: 701 (Aug.) 1933.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Beaumont Celebration.—A joint meeting of the Los Angeles County Medical Association and the Barlow Medical Library, December 5, commemorated the one hundredth anniversary of the publication of William Beaumont's "Experiments and Observations on the Gastric Juice and the Physiology of Digestion." Dr. George Dock, Pasadena, president of the medical library association, discussed the Beaumont collection at St. Louis; Dr. Rolla G. Karshner, Los Angeles, Beaumont's life, and Harry Deuel, Jr., Ph.D., Los Angeles, the book. There was a display of first and second editions of the volume, and photostatic copies of letters of Dr. Beaumont and Alexis St. Martin, and of Dr. Beaumont's diary.

Society News.—Dr. Roy F. Nelson, Oakland, discussed "Peroral Endoscopy—Its Place in Medical Practice" before the Alameda County Medical Association, November 20.——At a meeting of the Pacific Physical Therapy Association in Hollywood, November 15, the speakers included Dr. George S. Sharp, Pasadena, on "Diagnosis and Treatment of Superficial Cancer."——The Society for Neurology and Psychiatry, Los Angeles, was addressed, November 22, among others, by Drs. Karl A. Menninger, Topeka, Kan., and Howard L. Updegraff on "Psychoanalytic Aspects of Plastic Surgery."——Dr. Hugh Cabot, Rochester, Minn., speaks today before the Medical Symposium Society of Los Angeles, on "Effect of Drainage of the Kidney by Nephrostomy on the Recovery of Kidney Function."——Dr. P. K. Ito, president, Japanese Medical Association, was one of the guest speakers before the International Medical Club in Los Angeles, November 24.——A joint meeting of Los Angeles County medical and dental associations will be addressed, December 19, by Dr. Edward C. Rosenow, Rochester, Minn., on relation of focal infection and elective localization of streptococci in the causation of disease.——The fourth annual conference of mosquito abatement officials in California was held in Berkeley, December 12.——Dr. Hugh Cabot, Rochester, Minn., presented a historical review of the development of prostatectomy with an appraisal of present methods before the San Francisco County Medical Society, December 11.

COLORADO

Society News.—At a meeting of the Medical Society of the City and County of Denver, December 5, Drs. Harry Gauss and Clough T. Burnett discussed "Interrelationship between Gastro-Intestinal and Renal Disease" and "Cardiovascular Syphilis," respectively, and Dr. Thaddeus P. Sears reported a case of hyperparathyroidism. A symposium on cancer of the breast was presented before the society, November 21, by Drs. William W. Haggart, John E. Struthers, William W. Williams, Harry S. Finney and William Walter Wasson.

CONNECTICUT

Thousands of Roentgenograms.—Since the Connecticut State Health Department initiated its tuberculosis campaign in October, more than 12,000 children have had roentgenograms made. Because of the demands of the communities to have this work done, a second x-ray unit was placed in operation, November 9. The program, which is under way in more than 100 cities and towns in the state, is a joint effort to detect tuberculosis in the early stages sponsored by the state department of health, the state medical society, the state board of education and the state tuberculosis commission.

DISTRICT OF COLUMBIA

University News.—Dr. James W. Jobling, professor and executive officer, department of pathology, Columbia University College of Physicians and Surgeons, delivered the November lecture of the Smith-Reed-Russell series at George Washington University School of Medicine, on arteriosclerosis. William W. Cort, Ph.D., Baltimore, gave the October lecture, on "Recent Developments in Our Knowledge of Hookworm Disease."

Society News.—Speakers before the George M. Kober Medical Society, November 20, were Drs. Hugo Einstein on "Hydronephrosis and Hydro-Ureter" and Lewis B. Hill, Baltimore, "Psychiatric Aspects of Essential Hypertension."——Dr. Alexander Bruno of the American Hospital in Paris addressed the District of Columbia Tuberculosis Association, Washington, October 30.——Dr. Dean Lewis, Baltimore, delivered an address in the Army Medical Center, November 20, on "Diagnostic Failures and Their Lessons."

ILLINOIS

University News.—Forty staff members of the University of Illinois College of Medicine, Chicago, visited the Urbana campus, November 17, and were addressed, among others, by George L. Clark, Ph.D., on researches of medical interest from the x-ray laboratory; Elmer Roberts, Ph.D., genetic studies on inheritance of resistance to bacterial infection, and Frederic R. Steggerda, Ph.D., absorption and excretion in the colon.

Society News.—Dr. Max Thorek, Chicago, addressed the McHenry County Medical Society, November 16, on "Nonsurgical Treatment of Osteomyelitis."——At a meeting of the Peoria City Medical Society, November 21, Broda O. Barnes, Ph.D., Chicago, discussed "Studies on the Pituitary Especially Related to Diabetes."——The McDonough County Medical Society was addressed in Macomb, November 14, by Drs. Frank J. Jirka and John J. McShane, Springfield, on epidemic encephalitis and scarlet fever control, respectively. Mr. S. V. Layson discussed milk sanitation. All represented the state health department.——Dr. William J. Benner, Anna, was chosen president of the Southern Illinois Medical Association at its fifty-ninth annual meeting in Centralia, November 3. Dr. Ben Fox, West Frankfort, was named secretary, and Mount Vernon designated as the place for the next annual meeting. Speakers included Drs. Vilray P. Blair and Harry S. Crossen, St. Louis; Walter C. Alvarez, Rochester; George T. Palmer, Springfield; Andy Hall, Mount Vernon; William H. Smith, Benton, and Philip H. Kreuscher, Chicago.——At a meeting of the La Salle County Medical Society in La Salle, November 23, the speakers were Drs. John T. Murphy, Toledo, Ohio, and Vincent J. O'Conor, Chicago, on "Cancer of the Ovary" and "Recent Advances in the Field of Genito-Urinary Surgery," respectively.

Chicago

Dr. Lewis's Lecture at Northwestern.—Dr. Dean Lewis, Baltimore, President, American Medical Association, will give an address, December 19, in Thorne Hall, Northwestern University Medical School, under the auspices of Pi Kappa Epsilon Fraternity. The subject will be "Tumors of the Sympathetic Nervous System and Their Clinical Syndromes."

Dr. Lahey to Lecture on Goiter.—Dr. Frank H. Lahey, Boston, will present a symposium on goiter before the Chicago Medical Society, December 20. He will speak on "Diagnosis and Management of Thyroid States as the General Practitioner Sees Them." Participating in the discussion will be Drs. Nelson M. Percy on surgery; James H. Hutton, endocrinology; Charles A. Elliott, internal medicine, and Maximilian J. Hubeny, radiology. At a dinner, preceding the meeting, Dr. Lahey will discuss "Thyroidectomy Technic."

Forging Narcotic Prescriptions.—Don Eduardo de Ramos, following a plea of guilty to nine charges, was sentenced to one year in the House of Correction and fined $500 and costs, November 20, for representing himself to be a licensed physician, according to the Chicago *Tribune*. De Ramos, who said he was a graduate of the University of Barcelona, Spain, was seized by federal narcotic agents, November 18, who charged him with forging narcotic prescriptions for his own use. Information in the headquarters of the American Medical Association reveals that de Ramos claimed to be a graduate of McGill University, Montreal, and also of the Royal Academy of Medicine, University of Valencia, Spain. No record was found at either of these institutions showing the graduation of de Ramos.

INDIANA

Hospital News.—Fire destroyed the Mills building at Boehne Tuberculosis Hospital, Evansville, November 25, with a loss estimated at $85,000. The building is used for child patients, but none were in it when the fire broke out. It was the newest unit of the hospital, having been dedicated in 1929 and named for the late superintendent, Dr. George E. Mills. County commissioners have begun plans for rebuilding.

Society News.—Dr. Albert Graeme Mitchell, Cincinnati, addressed the Indianapolis Medical Society, November 21, on tonsillectomy.——The Jay County Medical Society heard Dr. Robert M. Moore, Indianapolis, discuss coronary occlusion at its meeting in Portland, November 3.——Dr. Frank W. Cregor, Indianapolis, spoke before the Gibson County Medical Society in Princeton, November 13, on "Treatment of Skin Diseases Common to the General Practitioner, Including Fungus Infection."——Medical economics was discussed by Dr. Everett E. Padgett, Indianapolis, before the Carroll County Medical Society in Camden, November 10.——Dr. Vernon M. Leech, Chicago, discussed common diseases of the eye before the Porter County Medical Society in LaPorte, November 28.——At a meeting of the Fayette-Franklin County Medical Society in Connersville, November 14, Dr. Frank C. Walker, Indianapolis, spoke on pelvic infections.——At a meeting of the LaPorte County Medical Society in LaPorte, November 16, Dr. Newell C. Gilbert, Chicago, discussed "Bedside Diagnosis of Cardiac Arrhythmias."——Speakers before the Cass County Medical Society in Logansport, November 17, were Drs. Charles T. Dutchess, Galveston, on "Intravenous Glucose"; Harry D. Tripp, Kewanna, "Local Anesthesia in Labor," and Clifford L. Williams, "Neurologic Changes in Pernicious Anemia."——Dr. Floyd H. Lashmet, Ann Arbor, addressed the Northeastern Indiana Academy of Medicine at Kendallville, November 23, on "New Concepts of Renal Function and Nephrotic Type of Edema."

IOWA

Dr. Spilman Honored.—Dr. Smith A. Spilman, past president of the Iowa State Medical Society, was guest of honor at a dinner given in Ottumwa, October 17, by the Wapello County Medical Society and the Ninth Councilor District Medical Society. Dr. Charles B. Taylor, Ottumwa, president, state medical society, presided, and, in addition to Dr. Spilman, the speakers included Drs. Walter L. Bierring, Des Moines, President-Elect, American Medical Association; Murdock Bannister, Ottumwa, and Thomas U. McManus, Waterloo, a former president of the state society. A gavel was presented to Dr. Spilman and it was announced that a life membership in the state medical society had been conferred on him.

Tilton Fined Again.—Lester J. Tilton, head of the Tilton laboratories at Clinton and known to his "patients" as "Dr. Tilton," was fined $1,000 by Judge Dewey in Des Moines, November 27, for violation of the federal Food and Drugs Act. A jury had previously found him guilty in Davenport. He was given forty-two days to perfect an appeal. The fine was the maximum under the act for a first offense: $200 on each of five counts, for selling preparations falsely and fraudulently recommended for the treatment of numerous diseases. The drugs, which the government proved were falsely and fraudulently labeled, included:

Pyroligeneous Compound number 1, recommended for ulcers of the stomach, sore mouth, pyorrhea, sore throat, hemorrhoids and female troubles.

Pyroligeneous Compound number 2, recommended for swollen glands, varicose veins and goiter.

Healing Ointment, recommended for tonsillitis, sore throat, abscesses, appendicitis, pus conditions of pleura and sore lungs.

Analyses of the products showed that the ointment was a compound of petrolatum and turpentine, and that the liquids were small amounts of pyridine, ammonia and ammonia compound. Tilton testified that the liquids were fractional distillates of peat taken from his farm. Tilton was convicted two years ago in Chicago of violation of Illinois medical practice laws. He was fined $2,000 and sentenced to from one to five years in prison. According to the Chicago *Tribune*, the appellate court confirmed the sentence, December 11.

KANSAS

Personal. — Dr. Calton B. Grissom, Syracuse, has been appointed health officer of Hamilton County.——Dr. James E. Wolfe, Wichita, succeeds Dr. Russell E. Hobbs, resigned, as city director of public welfare. —— The appointment of Dr. Edwin C. Button, Great Bend, as health officer of Barton County, succeeding the late Dr. Addison Kendall, has been announced.

Society News.—Dr. Tony G. Dillon, Kansas City, discussed thrombosis of the renal veins before the Wyandotte County Medical Society, December 5. —— Dr. La Verne B. Spake, Kansas City, discussed infections of the mouth before the Wyandotte County Medical Society, November 18.——At a meeting in Wellington, Dr. Harold Swanberg, Quincy, Ill., addressed the Tri-County Medical Society (Sumner and Cowley counties and Kay County, Okla.), November 16, on radium therapy.

MARYLAND

Celebration in Honor of Dr. Sudhoff. — The eightieth birthday, November 26, of Dr. Karl Sudhoff, professor emeritus of the history of medicine, University of Leipzig, was commemorated, November 27, by members of the Johns Hopkins Medical History Club, in the lecture hall of the Welch Medical Library, Baltimore. Papers on the life and work of Dr. Sudhoff were read by Drs. Henry E. Sigerist, professor of the history of medicine, Johns Hopkins University Medical School; Fielding H. Garrison, librarian of the Welch Medical Library and lecturer in the history of medicine; John R. Oliver, associate in the history of medicine, and Owsei Temkin, associate in the history of medicine. An exhibit of the work of Dr. Sudhoff was on display. Dr. Sudhoff was director of the Institute of Medicine at the University of Leipzig from 1905 until his retirement in 1925, when he was succeeded by Dr. Sigerist. He practiced in Germany more than thirty years, was a Prussian sanitary councilor for four years, and was the first president of the German Society for the History of Medicine. He is known as a translator of Arabian and Egyptian hieroglyphics and ancient Hebrew texts. Dr. Sudhoff delivered an address at the dedication of the Institute of the History of Medicine at Johns Hopkins University in 1929.

MISSISSIPPI

Society News.—At a recent meeting of the Central Medical Society, the speakers were Drs. E. L. Green, Carpenter, on "Intramuscular Injection Method of Treating Pernicious Anemia with Liver Extract"; Walter F. Henderson, Jackson, "Hernia of the Stomach Through the Diaphragm Causing Hemorrhage," and Oscar N. Arrington, Brookhaven, "Cholecystitis." Dr. Marvin Brister Ware, Jackson, among others, addressed the society, October 3, on "Acute Hemorrhagic Pancreatitis."——The East Mississippi Medical Society was addressed, October 19, among others, by Dr. Leonard Hart, Meridian, on heart disorders.——Speakers before the semiannual meeting of the Clarksdale and Six Counties Medical Society, November 8, included Dr. W. Likely Simpson, Memphis, on "Cancer of the Larynx," and Col. Edward W. Smith, attorney, "Legal Medicine."

NEBRASKA

X-Ray Installation at Lincoln.—X-ray equipment with a constant potential of 700,000 volts has been installed for treatment of cancer at the Lincoln General Hospital. An annex to the hospital was built for the new apparatus, consisting of a two story room for the eight transformers, a treatment room below the room containing the 15 foot tube, and a control room. Eight tons of lead was used in the lining of the treatment room. A periscope allows the physicist or physician to observe the patient constantly and microphone and loud speaker equipment makes conversation possible between them. In addition there are thirty new rooms for patients in the wing. Dedication ceremonies were held, October 5, with Lauriston S. Taylor of the Bureau of Standards, Washington, D. C., as the principal speaker. Among those who attended were Drs. Adolph Sachs, Omaha, president, Nebraska State Medical Association; Joseph Bixby, Geneva, president-elect, and Albert F. Tyler, Omaha. Dr. Roscoe L. Smith is the radiologist in charge.

NEW JERSEY

New Officials of State Society.—The office of the Medical Society of New Jersey has been moved to 137-139 East State Street, Trenton. Dr. Leroy A. Wilkes is executive secretary and Dr. Alfred E. Shipley, Trenton, editor of the society's journal. Dr. Henry O. Reik, Atlantic City, formerly held both these positions.

Health at Camden. — Telegraphic reports to the U. S. Department of Commerce from eighty-five cities with a total population of 37 million, for the week ended December 2, indicate that the highest mortality rate (18.3) appeared for Camden, and the rate for the group of cities as a whole was 11.4. The mortality rate for Camden for the corresponding week of 1932 was 15.4 and the rate for the group of cities, 12. The annual rate for the eighty-five cities was 10.9 for the forty-eight weeks of 1933, as against a rate of 11 for the corresponding period of the previous year. Caution should be used in the interpretation of weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas or that they have large Negro populations may tend to increase the death rate.

NEW MEXICO

Personal.—Dr. Howe Eller, Los Lunas, has been appointed health officer of Bernalillo County to succeed Dr. James R. Scott. Dr. Eller's appointment will be effective, June 1, 1934, when he returns from a year's study of public health at Johns Hopkins University. Meanwhile Dr. Ralph W. Mendelson, Albuquerque, will serve as acting health officer.

NEW YORK

Society News.—Dr. Edward M. Livingston, New York, addressed the Suffolk County Medical Society, Riverhead, October 26, on "Abdominal Emergencies—Relation to Tenderness, Hyperalgesia and Abdominal Rigidity."——Dr. William Edward Gallie, Toronto, addressed the Medical Society of Erie County, Buffalo, November 1, on "Treatment of Fractures Involving Joints." —— Dr. Ethan Flagg Butler, Elmira, addressed the Saranac Lake Medical Society, November 1, on "Carbon Dioxide Content of Blood as an Index of Respiratory Efficiency." Dr. Stafford D. Warren, Rochester, addressed the society, November 15, on artificial fever and Dr. Wardner D. Ayer, Syracuse, December 6, on intracranial hemorrhage. ——Dr. Murray B. Gordon, New York, addressed the Buffalo Academy of Medicine, November 22, on "Criteria of Diagnosis of Endocrine Conditions in Infants and Children."——Dr. Frederick H. Flaherty, Syracuse, president, Medical Society of the State of New York, addressed the Broome County Medical Society and the Binghamton Academy of Medicine, Binghamton, December 5, on the work of the state society.——Dr. Albert D. Kaiser, Rochester, was the guest speaker at the annual dinner meeting of the Medical Society of the County of Albany, December 12. Dr. Kaiser described his experiences as physician on an expedition to Africa.

New York City

Sale of Poisonous Eyelash Dyes Prohibited. — Reports of serious injury to the eyes of women and girls indulging in a new practice of dyeing eyebrows and eyelashes led the New York City health department to place a ban on the sale of all dyes containing aniline derivatives, paraphenylenediamine, paratolylenediamine and various dangerous mineral salts. No cases of eye injury have been found in New York, the department announced, but a study showed that the use of dyes is increasing rapidly and the action was taken as a precautionary measure.

Afternoon Lectures at the Academy.—Dr. Arthur Krida, professor of orthopedic surgery, New York University and Bellevue Medical College, delivered the fifth afternoon lecture of the New York Academy of Medicine, December 1, on "Surgical Treatment of Chronic Arthritis." Dr. Lloyd F. Craver gave the sixth lecture, December 8, on "Differential Diagnosis and Treatment of Lymphosarcoma, Hodgkin's Disease and Allied Conditions," and Dr. William W. Herrick, the seventh, December 15, on "Acute Rheumatic Fever: A Review of Recent Studies and Their Relation to the Clinical Features."

Health Services in New York.—About 250 organizations that render health services are listed in a new directory of social agencies published by the Charity Organization Society. Among these are 86 general hospitals and more than 100 special hospitals, which include 38 for tuberculosis, 15 for nervous and mental diseases, 9 for women and children, 9 for the chronically ill, 8 for diseases of the eye, ear, nose and throat, 7 orthopedic hospitals, 6 for contagious diseases and 5 specializing in skin diseases and cancer. There are 70 maternity services and 23 nursing services in the city. The directory shows 200 agencies for family welfare and about 200 engaged in child welfare work. More than 50 agencies provide education and

care of the physically handicapped, including 25 serving the blind, 15 the crippled, 15 the deaf and hard of hearing and 5 offering various general services to the handicapped. About 1,000 agencies are listed in the directory.

NORTH DAKOTA

Woman Physician Honored.—Dr. Helena K. Wink, Jamestown, was guest of honor at a banquet given by the Stutsman County Medical Society, October 25, in honor of her completion of fifty years in the practice of medicine. Dr. William A. Gerrish paid tribute to Dr. Wink in a review of medicine in North Dakota during the past half century and Dr. Claude F. Dixon, Rochester, Minn., delivered an address on cancer of the colon. Dr. Wink is a graduate of the University of Michigan Medical School.

OHIO

Director of Surgery Appointed.—Dr. Charles A. Bowers, Cleveland, has been appointed director of the division of surgery of St. Luke's Hospital, Cleveland, to succeed Dr. Carl H. Lenhart. Dr. Bowers has been acting director since Dr. Lenhart resigned last December to become director of surgery at University Hospitals. A graduate of Johns Hopkins, Dr. Bowers was on the resident surgical staff of Lakeside Hospital for seven years and has also served on the staffs of City and Charity hospitals in Cleveland. He has been president of the board of education of Shaker Heights, a suburb of Cleveland, for ten years.

PENNSYLVANIA

Society News.—Dr. Richard A. Kern, Philadelphia, recently delivered a series of lectures on allergy before the Lackawanna County Medical Society, Scranton.——Dr. Frederick B. Utley, Pittsburgh, addressed the Erie County Medical Society, November 7, on focal infections.

Personal.—Dr. Harold A. Miller, Pittsburgh, has been appointed by the state emergency relief board as director of emergency medical relief, at the Capitol Building, Harrisburg. ——Dr. John C. Davis has recently been appointed superintendent of the Meadville (Pa.) City Hospital.——Dr. John L. Ressler has resigned as superintendent of Lancaster County Hospital for Insane, Lancaster.

Local Physicians to Examine Conservation Corps.—At the suggestion of Dr. Harold A. Miller, director of medical relief for the State Emergency Relief Board, members of the winter conservation camp corps will be examined for fitness by the local medical profession in communities where the camps are located, according to the *Pittsburgh Medical Bulletin*. In Pittsburgh, laboratory work, except urinalyses, will be done by the city department of health. A small fee will be paid for the examinations, which will be made at central examining depots on days specially arranged.

Philadelphia

Society News.—Speakers at a meeting of the Philadelphia Urological Society, November 27, were Drs. Sloan G. Stewart, on "Cardiovascular Considerations in Benign Prostatic Obstruction"; Herbert T. Kelly, "Medical Management of Diabetes Complicating Benign Prostatic Obstruction" and George C. Griffith, "Choice of Anesthesia in Prostatic Surgery."

Committee on Emergency Relief.—Dr. George P. Muller has been appointed chairman of a medical advisory committee to the Philadelphia County Emergency Relief Board for arbitration of questions of dispute concerning payment to physicians for relief work and interpretations of the rules governing the new plan. Members are Drs. Charles A. E. Codman, Myer Solis-Cohen, William Egbert Robertson, Francis Ashley Faught, Nathan Blumberg and Isidor P. Strittmatter.

TENNESSEE

Society News.—Dr. Charles C. Vinsant, Maryville, addressed the Blount County Medical Society, December 7, on "Early Diagnosis and Treatment of Carcinoma of the Cervix," and Dr. Horace Dewey Peters, Knoxville, spoke, December 14, on "Hyperthyroidism."——Dr. Gilbert M. Roberts addressed the Hamilton County Medical Society, Chattanooga, December 14, on transurethral resection of the prostate.——Drs. John B. Haskins, Chattanooga, and Jesse B. Naive, Knoxville, addressed the McMinn County Medical Society, November 9, on appendicitis and tuberculosis, respectively.——Dr. William Litterer addressed the Nashville Academy of Medicine, November 7, on "Laboratory Diagnosis of Rocky Mountain Spotted Fever and Endemic Typhus Fever."——Speakers before the medical society of Henry, Carroll, Weakley and Benton counties in McKenzie, November 7, were Drs. William D. Haggard, on "Carcinoma of the Colon and Rectum"; Milton S. Lewis, "Treatment of Eclampsia," and Henry L. Douglass, "Interstitial Cystitis." All are from Nashville.——The Washington County Medical Society held its regular meeting at the Veterans Administration Facility, Johnson City, November 9; speakers were Drs. Walter R. Wynne and William M. Bevis, of the hospital staff, on "Roentgenologic Diagnosis of Pulmonary Tuberculosis" and "Common Neuropsychiatric Conditions," respectively.——Drs. Sidney Meeker and Arthur G. Jacobs addressed the Memphis and Shelby County Medical Society, November 7, on "Therapeutic Intravenous Use of Hydrochloric Acid" and "Diet and Vitamins in Relation to Teeth," respectively.

VIRGINIA

New Editor of State Journal.—Dr. Wyndham B. Blanton, Richmond, has been appointed editor of the *Virginia Medical Monthly*, official organ of the Medical Society of Virginia, to succeed Dr. Alexander G. Brown, Jr., resigned. Dr. Brown had edited the journal since 1919, when it was acquired by the society. In addition he has been chairman of the program committee of the state society and clinical professor of medicine at the Medical College of Virginia. Dr. Blanton is professor of medicine at the college and, as chairman of the state society's committee on history of medicine in Virginia, has compiled three volumes of state medical history.

PUERTO RICO

Legislature Honors Dr. Ashford.—A bronze bust of Dr. Bailey K. Ashford, recently retired as a colonel of the medical corps, U. S. Army, has been completed and will be placed in the government building in San Juan. This honor was conferred on Dr. Ashford by unanimous vote of the legislature of Puerto Rico to recognize him as founder of the School of Tropical Medicine and as initiator of the first campaign against hookworm disease in America. In 1899, Dr. Ashford determined the cause of anemia of the agricultural class of Puerto Rico, later known as hookworm disease, and in 1904 established the Puerto Rican Anemia Commission, which inaugurated the first drive against hookworm in America, treating 300,000 persons. Dr. Ashford is professor of tropical medicine and mycology at Columbia University, collaborating with the School of Tropical Medicine of Puerto Rico. He is a former president of the American Society of Tropical Medicine.

GENERAL

Nationwide Study of Foods Requested.—A resolution requesting the federal government to cooperate with educational and medical institutions in making a nationwide study of nutritional values of foods in various sections of the country as an aid to combating dietary diseases was adopted by the Southern Medical Association at its annual meeting in Richmond in November. It was stated that studies made in isolated sections of the country are inadequate, since under certain circumstances chemical elements of foods show marked differences in value. In some localities, the resolution said, certain vegetables absorb poisonous substances which render them of doubtful value.

Oral and Plastic Surgeons Meet.—Chalmers J. Lyons, D.D.S., Ann Arbor, Mich., was elected president of the American Association of Oral and Plastic Surgeons at its annual meeting in New York, November 16-18, and Dr. Ernest Fulton Risdon, Toronto, was reelected secretary. Among papers presented were the following:

Dr. John M. Wheeler, New York, Surgical Treatment of Exophthalmos in Graves' Disease.
Dr. Joseph Eastman Sheehan, New York, Facial Paralysis.
Dr. William Darrach, New York, Treatment of Chronic Osteomyelitis.
Samuel R. Detwiler, Ph.D., New York, Embryonic Surgery and the Production of Anomalies.

At the annual dinner, Dr. Jerome P. Webster, New York, presented a paper on the life and works of Gaspare Tagliacozzo, "father of plastic surgery."

Index to Veterinary Literature.—Through the Imperial Bureau of Animal Health, Weybridge, Surrey, England, there has just been made available the first number of a new index to the literature of veterinary medicine, *Index Veterinarius*. The editor of the *Index* is W. A. Pool, a member of the Royal College of Veterinary Surgeons and also editor of the *Veterinary Bulletin*. The *Index* is to be issued quarterly in a single alphabet. There is exceedingly full cross indexing by countries, animals, organs and similar subheadings. Approximately one

thousand bulletins, medical and veterinary periodicals, pamphlets and reports relating to veterinary medicine are covered by the *Index*. The subscription price annually is £4.

Officers of Society of Tropical Medicine.—Dr. Edward B. Vedder, Washington, D. C., was chosen president-elect of the American Society of Tropical Medicine at its annual meeting in Richmond, Va., November 15-17. Dr. Frederick F. Russell, New York, became president. Dr. Francis W. O'Connor, New York, is vice president and Dr. Henry E. Meleney, Nashville, Tenn., secretary. The next annual meeting will be in San Antonio, Texas, in November, 1934. The following honorary members were elected at the meeting: Drs. William H. Welch, Baltimore; Bailey K. Ashford, San Juan, Puerto Rico; Charles Nicolle, director of Pasteur Institute, Tunis; W. A. P. Schüffner, School of Tropical Medicine, Kolonial Institut, Amsterdam, Holland, and Sir Leonard Rogers, London School of Hygiene and Tropical Medicine, London.

Government Services

Public Health Service Changes Policy on Appointment of Interns

The United States Public Health Service announces that during January, 1934, applications will be received for second year internships to begin about July 1, 1934, from physicians not over 30 years old who have graduated from class A medical schools and who will complete one year's internship at an approved hospital before next July. This is a change of policy, interns having been appointed heretofore immediately after graduation. Applications are desired only from candidates who are interested in the service as a career and who wish to take professional examinations similar to those given for appointment in the regular commissioned corps. In addition, applicants must appear before a board of the service for examination as to physical condition and general fitness. Those who pass these tests successfully will be offered appointments as interns with quarters, subsistence and laundry and $79.74 per month. Appointments will be made according to the number of vacancies, with the understanding that opportunity will be afforded in about a year to take the regular corps examination for appointment as assistant surgeon. Attainment of the necessary passing grade in this examination will establish the candidate's eligibility (for one year) for appointment as assistant surgeon. This rank corresponds as far as pay and allowances are concerned to the rank of first lieutenant in the United States Army. Those interested should address inquiries to the Surgeon General, U. S. Public Health Service, Washington, D. C., in January, to obtain more information and the necessary application blanks.

Report of Food and Drug Administration

During the last fiscal year the Food and Drug Administration collected 47,646 samples of food and drugs, according to the annual report issued November 14. The administration prosecuted 1,153 violators of the law and made 1,624 seizures, 2,777 legal actions in all. Of 22,205 samples of imported foods and drugs, 3,245 shipments were detained. The year's samples included an unusually large number of fresh fruits and vegetables examined for residues of poisonous sprays; less than 7 per cent of interstate shipments exceed world tolerance, the report states. An important prosecution resulted in prison sentences for pedlers of poison jamaica ginger (THE JOURNAL, September 9, p. 862). Others covered shipments of adulterated tomato paste; worm-infested tullibee fish; dentifrices falsely and fraudulently labeled for diseases of the teeth and mouth; an "inhalant" falsely and fraudulently labeled as being useful in the cure of many diseases, including tuberculosis and diabetes; and allegedly "watered" oysters. The administration made 439 seizures of worthless "patent medicines" and initiated 307 criminal actions. It sampled and analyzed 310 shipments of so-called antiseptics, sixty-nine legal actions being taken. During the year only eight shipments of anesthetic ether were libeled, as compared with nineteen the previous year. A resurvey of drugs listed in the U. S. Pharmacopeia and the National Formulary undertaken during the previous year was finished; of 2,922 samples collected and analyzed, 352, or 12 per cent, were substandard and were the subject of legal action. Thirty-four interstate and eighteen import shipments of alleged radioactive preparations were sampled during the year. Twenty of the domestic products warranted legal action and only four of the foreign shipments were allowed to enter.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 25, 1933.

Protection of Workers in Radiologic Departments

The X-Ray and Radium Protection Committee, which has been inquiring into the blood changes in workers in radiologic departments, has issued a questionnaire to hospitals, asking for details as to periodic examinations, length of service and results of treatment. At a meeting of the committee, presided over by the chairman, Sir Humphry Rolleston, the importance of blood examination as a danger signal was proclaimed. The following recommendations were made. 1. No person should be employed as an x-ray or radium worker whose blood (as tested by a complete blood count) or general health is unsatisfactory. 2. Before a person begins work or training, the normal leukocyte count should be found. If no total count reaches 6,000 per cubic millimeter and no lymphocyte count 1,200, the services of the worker should not be accepted. 3. Periodic total and differential counts should be made during the morning every six months in the case of the x-ray worker and every three months in the case of the radium worker. If a decided and sustained drop in the total leukocyte or lymphocyte count is found, the worker should cease work and be treated for an adequate period. When work is resumed, every care should be taken and the circumstances of the work be reviewed, so as to prevent any recurrence. It is not possible to lay down hard and fast rules for what may be considered pathologic changes in the blood, owing to the physiologic changes always taking place. But a leukopenia is the first change to occur in x-ray or radium workers. In order to detect this at an early stage, the following facts with regard to the content of the blood of normal persons must be taken into account: A leukocyte tide occurs twice daily; low in the morning and high in the afternoon, particularly between 3 and 4 o'clock. Superimposed on this are minor fluctuations detectable at intervals of minutes. The polymorphonuclears play the dominant part in all variations. In face of these variations, the leukocyte level of an individual can be determined only on the basis of a number of counts. Three afternoon counts should be made on the x-ray or radium worker when he begins work or training. Afternoon counts should be chosen, as the afternoon rise in the number of leukocytes is less pronounced in leukopenia than normally. A mild leukopenia can thus be detected without difficulty. When the subsequent routine counts are made, a single afternoon count is sufficient, if satisfactory. If, on the other hand, it is decidedly lower than the level normal to the individual, and this is confirmed by two further afternoon counts, a full investigation is essential.

Encouraging Record of Health of School Children

The annual report for 1932 of the chief medical officer of the board of education, Sir George Newman, shows that, with the exception of deformities, not a single disease has increased since 1931. Considering the widespread economic hardships, this is encouraging. Pulmonary tuberculosis shows a marked decrease. The incidence of definite cases was 0.5 per thousand in 1925; in 1932 it was only 0.2. Suspected cases were 1.6 and 0.6, respectively. Nonpulmonary tuberculosis also fell, from 1.1 to 0.7. Unfortunately the picture is less satisfactory in the case of defects of the teeth, eyes, nose and throat. In a report on deafness, Dr. Eicholz points out that 80 per cent of the cases of acquired deafness in England and Wales arise before 5 years of age, 10 per cent between the ages of 5 and 10 years, and only 1 per cent after 10 years. These figures, the chief

medical officer points out, suggest that the problem of defective hearing in children of school age is educational to a much greater extent than medical. The causes of acquired deafness are predominantly meningitis, measles, scarlet fever and whooping cough. The number of children dentally inspected was 3,302,238, an increase of 7 per cent over the preceding year. The number found to require treatment was 2,285,644.

The Increasing Cancer Mortality

In opening an extension of the Liverpool Radium Institute and Hospital for Cancer and Disease of the Skin, Lord Moynihan began by saying "If the law of averages holds good, 100 people now within range of my voice will die of cancer." He pointed out that, while the death rate of the great killing diseases had been reduced 20 per cent in the last twenty years, the death rate from cancer had increased 20 per cent. The infant death rate had been diminished by 45 per cent and the tuberculosis by 38 per cent. The greatest statistician in the world asserted that no fewer than half a million people die every year from cancer in the civilized world. Cancer was the only one of the great killing diseases in which the death rate was on the increase. The fact that more people lived to the cancer age was not a very considerable factor in the cancer mortality, nor was the greater accuracy of diagnosis responsible. If one should regard two of the organs affected with cancer in which the disease was easy to discover in the early stage one would find rather alarming facts. There had been an increase of 39 per cent in the death rate from cancer of the tongue in the last twenty years. Compared with forty years ago, the increase was 228 per cent. Excessive smoking rendered the tongue a vulnerable organ for the development of cancer. That should be a warning to the women who had adopted the male practice of smoking. The death rate from cancer of the breast had increased 28 per cent in the last twenty years.

A QUACK HAS NOT CURED ONE CANCER PATIENT

The enormous increase of cancer mortality took place despite the large number of operations performed for the disease throughout the world, with a mortality which was almost insignificant and with far more cures than ever before. Why, then, if cancer could be cured sometimes, was it not cured oftener? There were many explanations. Physicians who were skeptical about the results of operation too often gave the advice "Wait and see." If the disease turned out to be cancer, there was a much greater chance of recurrence, even if the operation was performed by an expert surgeon. The incredulity of the public was another reason. Then there was the desire for irregular methods. In the whole history of medicine, not a single patient had ever been cured of cancer by a quack. Of women with local cancer of the breast, 90 per cent were alive and well ten years after operation. But if the disease had long existed, 91 per cent were dead within the same period. Every case passed through a curable stage.

Ernest Edmund Maddox

The death, at the age of 73, of Ernest Edmund Maddox removes a great ophthalmologist. Born at Shipton, Oxfordshire, he was educated at Edinburgh University, where he graduated in 1882 and won the Syme Surgical Fellowship in 1884 by an essay on the accommodation and convergence of the eyes. He was appointed assistant ophthalmologic surgeon and tutor on the subject in the Edinburgh Royal Infirmary. During this time he was associated with the well known ophthalmic surgeons Argyll Robertson and Berry and made a high reputation as a teacher and operator. Ill health then caused him to abandon practice, but his mental activity was so great that he published several books and articles. On recovery in 1889 he was appointed ophthalmic surgeon to the Royal Victoria Hospital, Bournemouth. At this health resort he passed the remainder of his life. He was distinguished by the originality and the clarity of his teaching. His book on the clinical use of prisms and the decentering of lenses reached five editions and became the standard work on the subject. A most original book on the ocular muscles followed and was translated into German. He dealt with disorders of the extrinsic muscles of the eye and demonstrated his points by ingenious geometric proofs. His methods of treating latent muscular defects became generally accepted. He wrote the article on refraction in Latham and English's "System of Treatment." He was also ingenious in the invention of instruments. The Maddox rod is used all over the world in testing for ocular imbalance. Another instrument devised by him is the cheiroscope, or "eye wakener," which enables the partially amblyopic eye of a squinting child to be educated by a method that excites its interest. The child is induced to make a conscious effort with its hand, while its brain is unconsciously educated to perceive the image thrown on the retina by this effort. Other devices for which the ophthalmic surgeon has to thank him are his V test for astigmatism, his axis finder and his electrical warmer. In 1900 he was awarded the Middlemore prize of the British Medical Association for his essay on heterophoria as the best contribution to ophthalmology in the previous three years. In 1921 he obtained the Doyne memorial medal of the Oxford Ophthalmological Congress. He was a deeply religious man, whose whole life was inspired by the teachings of the Bible; but he never obtruded his views. He was extraordinarily modest and was kind to his patients, whether rich or poor.

PARIS

(From Our Regular Correspondent)

Nov. 1, 1933.

The French Congress of Surgery

The forty-second annual session of the Association française de chirurgie, the most important of the medical congresses held at Paris during the month of October, was a brilliant success. It was presided over by Professor Leriche, who, from the Faculté de médecine de Strasbourg, has recently returned to the faculty at Lyons, from which he came. His opening address was characterized by the presentation of many lofty ideals. He paid homage to his teacher at the University of Lyons, Professor Poncet. He pointed out that a lesion often is only the effect of a physiologic disorder that disappears spontaneously when the disorder is relieved by a slight operation, such as the extirpation of the parathyroids in scleroderma. His address was well received. Three topics were studied by the congress: (1) surgery of the parathyroids, (2) immediate treatment of fractures of the base of the cranium, and (3) surgical treatment of profuse gastroduodenal hemorrhages associated with ulcer.

SURGERY OF THE PARATHYROIDS

Velti of Paris and Young of Strasbourg presented a study on "The Surgery of the Parathyroids." The former gave a description of the surgical anatomy and emphasized the preponderant rôle of the external parathyroids and the need of avoiding their artery, which is terminal and the ligation of which always entails a necrosis. He considered at length the significance of calcemia and the various methods of determining it. Calcemia is highly important in hypoparathyroidism and in hyperparathyroidism, but it does not play a part in slight functional disorders. In postoperative hypoparathyroidism, calcemia is only an effect and not a cause. The untoward incidents may be grave, acute or chronic. Medical treatment has little effect, and grafts are seldom successful. Mr. Young considered particularly hyperthyroidism and the

clinical symptoms that it produces. Experimentally it acts on the metabolism of calcium and of phosphorus, which are always stimulated. He pointed out the chief clinical syndromes induced by the parathyroids: Recklinghausen's disease, ankylotic arthritis (in which surgery effects an improvement in only 25 per cent of the cases), osteomalacia, Paget's disease, scleroderma and keloids. He closed with a discussion on the technic of various operative methods. In the discussion that followed, Mr. Mandl of Vienna stated that one often finds hypertrophy without adenoma, in which case an operation does not give good results. Mr. Snapper of Amsterdam spoke on the changed proportions of calcium and of phosphorus, and on the value of ergosterol. Mr. Alessandri of Rome referred to fourteen cases in which operation was followed by bad results and two recoveries from adenoma. Mr. Pautrier of Strasbourg brought out that in scleroderma and in keloids he found hypercalcemia in two thirds of the cases. Mr. P. Weil discussed the relations between ankylotic rheumatism and the parathyroids. Weissenbach, Gatelier, Durupt and Rocher (Bordeaux) referred to cases of scleroderma improved by operation. Moulonguet, de Quervain (Liége), Bérard (Lyons), Paolucci (Bologna), Ufreduzzi (Turin) and Albert (Liége) discussed their operative treatments.

The immediate treatment of fractures of the base of the cranium was the subject of two papers by Lenormant and Patel (Paris), and Wertheimer of Lyons, who gave a minute description of cerebral and bony traumatisms and of all the proposed theories, without stating any very definite conclusion, so widely divergent are the views. In general, they condemned the undue use of lumbar puncture and recommended as a preferable means of diagnosis an examination of the intraspinal pressure and observation of the retinal circulation. Suboccipital puncture and posterior drainage by the Ody method sometimes give good results. Likewise preventive anti-infectious serotherapy is useful.

The papers that followed led to some confusion, as each author vaunted his own special methods. Mr. Lhermitte expressed the view that vasomotor disorders play the principal rôle in the accidents and that the surgeon can do nothing more than apply decompression by means of trephination. Mr. Henschen of Basel expressed the same view. Mr. Baillard emphasized the value of an examination of the retina. Mr. Ody of Geneva pointed out that his method of posterior drainage is valuable only for the purpose of counteracting blocking. Mr. Orban of Liége recommended ventricular puncture. Mr. Delrez of Liége reported a series of 128 cases with 22 per cent mortality. Mr. Oltramane of Geneva cited 280 cases in which intervention gave disappointing results. Mr. Bachy of St. Quentin handled 180 cases, treating medically the simple cases and applying trephination in grave cases. Mr. Termier of Grenoble has been disappointed with the results of trephination and drainage, and remains true to spinal punctures, deciding each case on its own merits, the same as Mr. Masini of Marseilles. Likewise Mr. Martin of Brussels favored lumbar puncture as against trephination; likewise Mr. Dziembowski of Poland. Mr. Tytgat of Ghent recommended intravenous injections of methenamine to prevent infection, and Mr. Proust of Paris advocated radiotherapy to aid in the absorption of hematomas. Mr. Julliard of Geneva reported a series of 2,086 cases covering a period of ten years. Of the 838 last cases, 31 per cent had a fatal issue on the spot; 15 per cent were beyond the aid of surgery. Of the others, 52 per cent ended in recovery and 28 per cent in invalidism. Mr. Senechal of Paris advocated lumbar puncture and Mr. Arnaud of Marseilles ventricular puncture. Mr. de Martel recommended manometric study of spinal pressure and emphasized the value of ventriculography.

On the surgical treatment of severe gastroduodenal hemorrhages of ulcerous origin, there were two papers; that of Mr. Felix Papin of Bordeaux dealt with the clinical indications. The danger from shock, the possible error in diagnosis, and the difficulty of finding the ulcer cause one to hesitate. Mr. Vilmoth of Paris discussed the indications for medical and surgical treatment. Perforation is an indication for operation. For the intervention, local anesthesia is preferable. The exact nature of the intervention will be determined only after laparotomy but should be radical rather than palliative (gastrectomy and pylorectomy, gastroduodenectomy). For the last mentioned operation, which is of rather grave import, exclusion of the pylorus, associated with gastro-enterostomy, may be substituted. To summarize, treatment of these hemorrhages requires a surgeon with a clinical sense of caution and skilful in all forms of operative technic.

In the discussion, Mr. Wilkie of Edinburgh took a conservative stand. An operation, he contended, is not advisable, in peptic ulcer, unless the hemorrhages are repeated. Gastrectomy appears to him rarely indicated. In duodenal ulcer, ligation of the vessels and gastro-enterostomy give good results in most of the cases. The mortality is twice as high in men as in women. Mr. Finsterer of Vienna advocated early operation as soon as the diagnosis of ulcer is reached. Late operations give mediocre results, but, he contends, still superior to the results of medical treatment. Mr. Oliani of Trieste presented his personal statistics, which favored early and radical intervention. Mr. Alessandri of Rome advised beginning always with medical treatment, with repeated small blood transfusions, with a view to operating later when the patient has become stronger. If the hemorrhage is repeated, an operation should be resorted to, following a heavy blood transfusion. Tixier and Clavel (of Lyons) reserve intervention for the cases of arterial erosion of callous ulcers, which may often be diagnosed clinically, and for hemorrhages due to stasis above a stenosis; here a derivative intervention is sufficient. Hemorrhage due merely to gastritis, with or without ulcer, requires most commonly medical treatment, or a later operation between attacks. Several surgeons presented their own statistics: Begouin of Bordeaux, Loewy of Paris, Dziembowski of Poland, Podlaha of Brno, Ferey of St. Malo, Delagénière, Jr., of Lemans, Pauchet of Paris, Arnaud of St. Etienne, and Santy of Lyons.

The discussion of the papers on the three official topics was followed, as usual, by a large number of individual communications on divergent subjects pertaining to surgery: surgical treatment of lung cavities, Dr. Maurer, Paris; treatment of exophthalmic goiter by means of subtotal extracapsular thyroidectomy, Dr. Gentil. Two of these communications in particular awakened the interest of the congress: that of Dr. Calot of Berck, who demonstrated that, in congenital luxations and subluxations of the hip, his treatment by early reduction and application of a plaster cast, in young patients, and by the application of a special orthopedic apparatus in the case of adults, gives results much superior to those secured by surgeons who apply bony grafts. He strengthened his demonstration with roentgenograms taken of persons operated on in the manner last described.

There were numerous presentations of technical films. Numerous demonstrations were given each morning in the hospitals.

The three topics selected for discussion at the congress next year were: (1) surgery of the suprarenal glands; (2) treatment of acute suppurative arthritis of the knee (war wounds excepted), and (3) pathogenesis and treatment of proliferative and stenosal rectitis.

Death of Dr. Roux

The death of Dr. Emile Roux, director of the Institut Pasteur, at the age of 83, is announced. He served as the prepar-

ator of Pasteur and was associated with him in his researches on anthrax and rabies. He discovered the antidiphtheritic serum simultaneously with Behring, and the antitetanic serum at the same time as Vaillard. Since then he had devoted himself exclusively to the management of the Institut Pasteur. The government took charge of the funeral ceremonies and the burial.

BERLIN

(From Our Regular Correspondent)

Oct. 30, 1933.

Reforms in the Institutions of Higher Learning

The reorganization of German institutions of higher learning is now being carried out. New regulations concerning habilitation at Prussian institutions have been established. Henceforth the demonstration of scientific performances or qualifications before the faculty in question will not suffice to secure permission to lecture at a Prussian institution of higher learning. An applicant must have served several months in a field station or a work camp and must have completed a course of training in an academy for the training of instructors in higher institutions of learning, which academy is to be newly created. When these two courses have been completed satisfactorily, a candidate for habilitation in a university or other higher institution will present his credentials to the faculty of the school in question, which will act on his application in the same way as heretofore. In the reorganization of the universities and other institutions, special importance is placed in the training of the oncoming generation of academic instructors. In the new regulations, it is emphasized that the decision whether an applicant has the necessary qualifications to become an instructor in a given institution was heretofore left to the faculty of that institution, and in some cases entirely to the single representative of a department, since, with the growth of the faculties, the faculty as a whole could not always form a judgment concerning the applicants. The result was, one reads further, that the selection of candidates was controlled more and more by departmental points of view and that the more general considerations were necessarily forced into the background. Thus capable scholars in a given field were selected, and the general qualifications were left to chance. If the universities are to undergo a real reorganization, a fundamental change in the method of selecting new instructors must be made. The new decree of the Prussian minister of public instruction, it is pointed out, has in two ways taken account of this need; for in the work camp the candidate has an opportunity to reveal his true character, in surroundings that are not academic. The testimonial issued by the work service will have great weight in determining a candidate's suitability for habilitation. The Dozentenakademie (for the training of instructors) will receive acceptable candidates from the Arbeitsdienst (work service) and will provide regular courses for candidates seeking admission to the various departments of the university. In this academy, candidates will participate in a strictly organized community life and will study courses of a general scientific character. Here, again, the candidate will have to prove his worth in fields outside his specialty. As a result of close collaboration with his fellows in the academy, a candidate is expected to develop the general impulses requisite for his scientific work in his specialty. The examination of the candidate in his specialty, which follows in due course, is, according to the new regulations, only the final step in the habilitation procedure. It is emphasized that no one will be selected as instructor solely on the basis of his capacity in his scientific specialty.

The *dozenten* of Prussia (instructors in universities and higher institutions of learning) have been organized into a society. Several different posts have been created in keeping with the duties to be performed. There is a scientific bureau, which will deal with all questions bearing on the scientific training of the oncoming generation of instructors, questions pertaining to reforms in the curriculum, and the question of the rights and privileges of Germans who have emigrated to foreign countries. There is also a bureau for work service, which is closely connected with the corresponding bureau of the German student body. Further bureaus have been created to aid in the solution of the technical problems at the various universities and higher institutions. At the several universities, a corresponding organization will be effected before the opening of the fall semester. The local directors were recently admitted to a field station. Assistants and instructors who have no fixed appointment must become members of the dozentenschaft, or society of instructors; but instructors holding definite posts, and assistants in research institutes and in municipal hospitals attached to a university, may join or not, as they see fit.

The University of Giessen in Hesse has adopted somewhat different regulations. In Hesse the rector of a university may grant the venia legendi to a privatdozent if the ministerial department having jurisdiction has given its consent; at first for a period of seven years, subject to cancelation. If, before the end of the seventh year, a privatdozent, or instructor, has not been appointed to a professorship, he automatically severs his connection with the instructional staff. This provision applies also to those instructors who have been previously appointed. Any one who is called by the government to occupy a chair is appointed as professor. The federal governor may appoint a privatdozent as a professor after at least five years of teaching activity. A privatdozent may, through the mediation of a colleague, appeal to the dean of the faculty and request that he be appointed as professor.

Reorganization of the Antituberculosis Campaign

With the transformation of the Zentralkomitee into the Reichs-Tuberkulose-Ausschuss, as announced in THE JOURNAL, September 2, p. 791, the authoritative state shows a determination to guarantee a more uniform conduct of the antituberculosis campaign. The previous efforts to effect a consistent organization of this crusade had, the administration of the new committee stated, benefited only a portion of the people (the insured and their families), whereas the constantly increasing army of persons receiving welfare aid, and the families of the uninsured middle class, received scarcely any benefit. The most important factor, however, was that the mode of combating tuberculosis was not compulsory but was dependent to a great extent on the degree of interest shown by the persons affected, and on their financial condition. Furthermore, there was too much dissipation of energy in the organizations, and the individual patient was often neglected because of uncertainty as to which organization had jurisdiction. Duplication of effort was the result. This was shown in the erection of an undue number of institutions and homes of various kinds, for the care of the tuberculous. Often legislators or judicial administrators were called on to decide purely medical questions. Now the Reich-Tuberculose-Ausschuss is the tuberculosis central. The committee is appointing a director for every district throughout the reich. The directors will be phthisiologists, who will see to it that all measures against tuberculosis are carried out uniformly. The present impracticable methods in vogue in most of the tuberculosis sanatoriums must be abolished. It may be impossible to avoid closing some institutions. It may be necessary to use some institutions for other purposes, in order more fully to use the others. An attack is to be launched against lupus. A special memorial on the subject has been prepared. The objective is a rapid and complete rounding

up of all lupus patients, bringing them under suitable medical treatment—when necessary, in special institutions and institutions of regular after-care—by proper organizations, until a complete cure is effected. As an introductory measure, a complete listing of all lupus patients has been undertaken, blanks on which the names of all such patients are to be entered having been sent to all practicing physicians.

NETHERLANDS

(From Our Regular Correspondent)

Oct. 11, 1933.

The Antituberculosis Campaign in the Netherlands

The tuberculosis mortality rate for the Netherlands during the past thirty years has dropped from 194 per hundred thousand in 1901 to 75 per hundred thousand in 1930. The Netherlands has at present the lowest mortality rate from tuberculosis of any country. At Amsterdam the tuberculosis mortality rate has diminished greatly, being at present only one third that of Paris. These results make interesting a study of the organization of the crusade against tuberculosis. The characteristic feature of the Netherlands system is private initiative. No legislation has been passed in the Netherlands concerning the combating of tuberculosis. The state, however, subsidizes and controls the organizations founded to combat tuberculosis. The annual subsidies received from the state amount to 1,300,000 florins ($800,000, current exchange). In addition to this participation by the central government, the provinces and the communes furnish financial aid. The government control is effected through a subdepartment of the ministry of the interior, which is charged with everything that concerns the hygiene of childhood, and crusades against tuberculosis and venereal diseases.

The organizations promoting the crusade against tuberculosis comprise the Central Netherlands Association, the provincial associations and the local associations. The central association comprises about 4,000 members and supervises a vast publicity campaign throughout the country. In each of the eleven provinces there is a provincial association, which coordinates the local societies. There are 800 local societies, for which the crusade against tuberculosis constitutes the exclusive form of activity.

The antituberculosis dispensaries function in association with the attending physician. The country is divided into twenty-eight districts, and each district has a dispensary in approximately the center. In the larger communes there are radiologic dispensaries to the number of 109. In charge of each district is a phthisiologic specialist, who gives his whole time to this service. Experience has shown that the presence of the medical specialist in each dispensary is indispensable to securing the complete confidence of the attending physicians and the patients, and there is no question that this method has produced good results. No treatment is given in any of the antituberculosis dispensaries in the Netherlands. The therapeutic institutions comprise sanatoriums, hospitals and centers for ambulatory patients. There are thirty-five sanatoriums available, with a total of 3,560 beds. Patients who cannot go to a sanatorium receive ambulatory treatment in so-called day camps. The country has also about a hundred hospitals, each with a special department for tuberculous patients. Three types of organizations provide child prophylaxis: the sanitary colonies, the sanitary schools and the fresh-air placement centers. Mention must be made also of the extensive trial of preventive vaccination with the B C G vaccine, as carried out at Amsterdam, which has diminished child mortality to a considerable extent.

The problem of postsanatorial aid has been solved in the Netherlands as follows: There is no permanent postsanatorial aid. The establishments confine their activity to temporary aid. Here patients are subjected to a progressive occupational reeducation, under severe medical control. In addition to these colonies, there are, in most of the provinces, workshops reserved for tuberculous patients, which are usually located near large cities. Several points stand out from this study. It will be seen that a methodical spirit and a sense of coordination characterize the organization of the antituberculosis crusade in the Netherlands. Collaboration of the general practitioner in the antituberculosis crusade contributes much to the ferreting out of cases. This is based on a strict abstention from all therapeutics in the dispensary. By reason of its organization, the dispensary becomes a center of the antituberculosis crusade, and its influence extends to the whole population.

Occupational Therapy in the Treatment of Tuberculosis

At the request of the association for occupational therapy and after-care in the treatment of tuberculosis, Drs. Bronkhorst, Hefting and Van Lier presented a communication on this subject. During the acute period, rest is absolutely required, either combined with special treatment or otherwise. Once a patient has improved to an extent that one can expect no further improvement from the treatment, occupational therapy should be begun to restore the patient's strength and readapt him progressively to a normal life. The patient receives no compensation for this work, as it serves exclusively for his rehabilitation and is of a different character from work that is paid for. In many patients a satisfactory rehabilitation cannot be brought about because there is a discrepancy between the recovery to be accomplished and the condition in which the patient may find himself after treatment. The after-treatment may, however, be remedied somewhat by (1) adaptation of hygienic and social conditions to the state of the rehabilitated patient, (2) augmentation of the theoretical and practical occupational value, and (3) regular medical examination. The tuberculosis treatment is dependent on two conditions: (1) degree of restoration and (2) nature of the conditions.

Effective treatment presupposes sufficient strength on the part of the patient. In estimating the patient's strength, account must be taken of the duration factors and especially of the time when the work is to be done. Tuberculous patients who do not recover 60 per cent of normal strength cannot usually be said to have recovered and are only temporarily improved.

Marriages

IVAN MAGNUS SANDBERG, Lostant, Ill., to Miss Charlotte Drew of Iron Mountain, Mich., at Tiskilwa, October 13.

ROBERT ELMER SUMMITT, Gainesville, Fla., to Miss Willie May Lang of St. Petersburg at Palatka, October 12.

RICHARD KLATTE SCHMITT, Columbus, to Miss Margaret Gordon Laing of Iron Mountain, Mich., in October.

CHARLES G. SMITH, Red Bud, Ill., to Miss Madlen Hauff of Chicago at West Chester, Pa., October 4.

DOUGLAS HAMILTON SPRUNT, Durham, N. C., to Miss Edith Charlescraft Lucas of Charlotte, October 17.

SAMUEL BASIL SOULEYRET, Coalburg, W. Va., to Miss Goldie Elizabeth Knight, August 16.

SAMUEL EDWIN HUGHES, JR., to Mrs. Willa Mae Davidson, both of Los Angeles, November 3.

RUDOLPH B. SIEGERT, Pana, Ill., to Miss Margaret Mary Twiss of Chicago, in November.

ROGER L. CREEKMUR to Miss Frances Irene Mitchell, both of Richmond, Va., October 21.

WILLIAM CHRISTOPHER SCHIELE, Galena, Ill., to Miss Ruth Enderes at Joliet, October 8.

HUBERT WORK to Mrs. Ethel Reed Gano, both of Denver, December 8.

Deaths

Alfred Fabian Hess ⊕ member of the Council on Pharmacy and Chemistry of the American Medical Association since 1932, died at his home in New York, December 6, of heart disease, aged 58 years. Dr. Hess was born, Oct. 19, 1875. He received his A.B. degree from Harvard University in 1897 and the M.D. degree from the College of Physicians and Surgeons of Columbia University in 1901. Following his graduation he studied abroad in Prague, Vienna and Berlin. He began the practice of medicine in New York, becoming professor of clinical pediatrics at the University and Bellevue Hospital Medical College. While in the practice of medicine he constantly engaged in research, particularly in the field of nutrition. In this work he contributed not only of his efforts and time but also financially. His contributions, especially in the field of the vitamins, brought him international recognition. He received the honorary degree of doctor of science from the University of Michigan in 1930; he was awarded the Johns Scott medal and the sum of a thousand dollars for his method of producing a vitamin factor in food by the use of ultraviolet rays in 1927. In 1933 he was invited to deliver the Ingleby lecture at the University of Birmingham in England. Dr. Hess was a member of the Association of American Physicians, the American Philosophical Society, the American Pediatric Society, the Society for the Advancement of Clinical Investigation and the Society for Experimental Biology and Medicine. He took intense interest in his work for the Council on Pharmacy and Chemistry, regularly attending each of its sessions and devoting much of his time to its problems. His contributions to medical literature included many papers in the field of pediatrics and experimental pathology and special monographs on scurvy and rickets. His death is a serious loss to the organizations to which he gave his services.

Miles Fuller Porter ⊕ professor of surgery in the Indiana University School of Medicine, Indianapolis, died in Fort Wayne, December 6. Dr. Porter was born in Decatur, Ind., Sept. 27, 1856. Following his education in the public schools, he received his M.D. from the Medical College of Ohio in Cincinnati in 1878 and an honorary M.A. degree from Franklin College in 1882. For some fifteen years after his graduation he did a general practice, devoting his attention thereafter wholly to surgery. He contributed many scientific articles to medical periodicals. Throughout his life he was especially interested in medical organization, serving as president of the Indiana State Medical Association, 1895-1896, and of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, 1912-1913. In the American Medical Association he was a member of the Board of Trustees from 1900 to 1909, the period immediately following the reorganization of the Association and one of the greatest importance for the development of the Association. He served also as a member of the House of Delegates of the American Medical Association in 1912 and from 1915 to 1918. Dr. Porter was surgeon to St. Joseph's Hospital and consulting surgeon to the Indiana School for Feebleminded Youth. He was also a member of the American Surgical Association, the Southern Surgical Association and Western Surgical Association, and a fellow of the American College of Surgeons.

Henry William Shaw ⊕ Augusta, Ga.; Maryland Medical College, Baltimore, 1905; member of the state board of control for eleemosynary institutions; formerly associate professor of obstetrics, University of Georgia Medical Department; at one time member of the city, state and county boards of health; served during the World War; aged 51; died, October 27, of arterial hypertension and cerebral hemorrhage.

William Augustus Carnes, Memphis, Tenn.; Tulane University of Louisiana Medical Department, New Orleans, 1896; served during the World War; for many years in the U. S. Public Health Service; on the staff of the U. S. Marine Hospital; aged 61; died, November 20, in the Gartly-Ramsey Hospital, of arteriosclerosis and bronchopneumonia.

Edwin Cassius Bates ⊕ Houlton, Maine; Columbia University College of Physicians and Surgeons, New York, 1908; member of the Associated Anesthetists of the United States and Canada; past president of the Aroostook County Medical Society; formerly on the staff of the Aroostook Hospital; aged 50; died, September 23.

Henry Clement Finch, Broadalbin, N. Y.; Albany (N. Y.) Medical College, 1882; member of the Medical Society of the State of New York; for many years president of the board of education, bank president and county coroner; aged 75; died, November 15, of carcinoma of the prostate and diabetes mellitus.

Hiram Lionel Horsman, North Grafton, Mass.; Medical School of Maine, Portland, 1899; member of the Massachusetts Medical Society, American Psychiatric Association and the New England Society of Psychiatry; assistant superintendent of the Grafton State Hospital; aged 63; died, November 13, of coronary thrombosis.

Cecil de Joline Harbordt, Dover, Del.; Maryland Medical College, Baltimore, 1905; member of the Medical Society of Delaware; served during the World War; formerly on the staff of the Kent General Hospital; aged 50; died, November 6, in the Delaware Hospital, Wilmington, of hemorrhage due to esophageal varices.

Jacob Sidwell Hackney, Uniontown, Pa.; Jefferson Medical College of Philadelphia, 1885; member of the Medical Society of the State of Pennsylvania; formerly secretary of the Fayette County Medical Society; on the staff of the Uniontown Hospital; aged 71; died, November 9, of myocarditis and coronary occlusion.

Frank Linden Richardson ⊕ Boston, Harvard University Medical School, Boston, 1903; member of the Associated Anesthetists of the United States and Canada; lecturer in surgery, Tufts College Medical School; anesthetist to the Boston City and Children's hospitals; aged 56; died, November 16, of heart disease.

Calvin T. Hood, Chicago; College of Physicians and Surgeons of Chicago, 1885; member of the Illinois State Medical Society; on the staffs of the Cook County, Illinois Masonic and Garfield Park hospitals; aged 71; died, November 25, at Rochester, Minn., of heart disease, following an operation for goiter.

Parker Fletcher Southwick ⊕ Sandusky, Ohio; Western Reserve University Medical Department, Cleveland, 1902; at one time county coroner; served during the World War; formerly on the staff of the Good Samaritan Hospital; aged 55; died, November 20, of cerebral hemorrhage.

William Robbins White, Providence, R. I.; Harvard University Medical School, Boston, 1877; an Affiliate Fellow of the American Medical Association; for many years on the staff of the Rhode Island Hospital; aged 84; died, November 3, of arteriosclerosis and bronchopneumonia.

Horace Gibson, Sheldon, Ill.; Northwestern University Medical School, Chicago, 1892; member of the Illinois State Medical Society; for many years mayor of Sheldon and member of the school board; aged 76; died, November 15, of coronary and cerebral thrombosis.

Charles Aloysius O'Reilly ⊕ Devon, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1900; member of the American Academy of Ophthalmology and Oto-Laryngology; served during the World War; aged 55; died, November 1, of heart disease.

Joseph Ambrose Kerrigan ⊕ Webster Groves, Mo.; University of the City of New York Medical Department, 1893; member of the Medical Society of the State of New York; aged 66; died, November 5, in the Evangelical Deaconess Hospital, of heart disease.

William James Costar, Jr. ⊕ Chico, Calif.; University of California Medical School, San Francisco, 1927; past president of the Butte County Medical Society; on the staff of the Enloe Hospital; aged 33; died, October 25, as the result of an automobile accident.

Emilius Morancy McKee, Lexington, Ky.; Miami Medical College, Cincinnati, 1900; member of the Kentucky State Medical Association; aged 57; formerly on the staff of St. Joseph's Hospital, where he died, November 17, of carcinoma of the stomach.

Earl Rice, Ames, Iowa; State University of Iowa College of Medicine, Iowa City, 1891; College of Physicians and Surgeons of Chicago, 1895; member of the Iowa State Medical Society; bank president; aged 65; died, October 30, of heart disease.

William Summerill Vanneman, Tabriz, Persia; University of Pennsylvania School of Medicine, Philadelphia, 1888; an Associate Fellow of the American Medical Association; medical missionary; aged 70; died, October 30, of pneumonia.

James Mark Scoville, Warren, Ohio; Western Reserve University Medical Department, 1885; for four years county coroner; aged 74; formerly on the staff of the Warren City Hospital, where he died, November 12, of agranulocytic angina.

Adolph Ernest Voges, White Bear Lake, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1904; city and county health officer; deputy county coroner; aged 54; died, October 21, of heart disease.

Stephen Allen Newman, Mount Vernon, Mo.; Marion-Sims College of Medicine, St. Louis, 1892; member of the Missouri State Medical Association; aged 65; died, August 18, of injuries received in an automobile accident.

John L. Hervey, Martins Ferry, Ohio; Medical College of Ohio, Cincinnati, 1892; member of the Ohio State Medical Association; aged 66; died, November 14, in the Martins Ferry Hospital, of chronic appendicitis and peritonitis.

John Quincy Owsley ⊕ Nashville, Tenn.; University of Tennessee Medical Department, Nashville, 1894; member of the Tennessee State Medical Association; aged 62; died, November 20, of carcinoma of the pancreas.

John Robinson Dickson, Showchow, Anhwei, China; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1910; medical missionary; aged 49; died, November 24, in Hwaiyuan, of acute endocarditis.

Ernest Stanley Barker, Cambridge, Mass.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1899; aged 63; died suddenly, November 6, of heart disease.

Thomas Marshall Sloan, Newton, N. C.; Medical College of Virginia, Richmond, 1929; aged 30; died, November 12, in a hospital at Statesville, as the result of injuries received in an automobile accident.

Charles Elmer Spring, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1893; aged 63; died, November 9, in the Billings Memorial Hospital, of a tumor of the prostate.

Arthur J. Simpson ⊕ Chillicothe, Mo.; University Medical College of Kansas City, 1895; on the staff of the Chillicothe Hospital; aged 59; died, October 31, of heart disease, following pneumonia.

Robert Pearmain Loring, Newton, Mass.; Harvard University Medical School, Boston, 1875; member of the Massachusetts Medical Society; aged 81; died, October 28, of cerebral hemorrhage.

Joseph Albert Coogan ⊕ Windsor Locks, Conn.; Bellevue Hospital Medical College, New York, 1876; formerly member of the state legislature; aged 84; died, November 24, of pneumonia.

Ocran W. Roff, Newton, Kan.; College of Physicians and Surgeons of Chicago, 1893; member of the Kansas Medical Society; also a pharmacist; aged 66; died, October 28, of pneumonia.

James Ashby Franklin, Cameron, Mo.; Jefferson Medical College of Philadelphia, 1886; Bellevue Hospital Medical College, New York, 1888; aged 71; died, November 10, of heart disease.

William Burgess Carman, Rochester, N. Y.; Hahnemann Medical College and Hospital, Chicago, 1884; aged 76; died, November 14, of chronic bronchitis with bronchiectasis.

Bernard Francis McElroy ⊕ San Francisco; University of California Medical Department, 1899; aged 60; died, November 7, in St. Francis Hospital, of cerebral hemorrhage.

Henry Ost, Newark, N. J.; Bellevue Hospital Medical College, New York, 1894; member of the Medical Society of New Jersey; aged 69; died, October 16, of cardiac embolism.

Herman August Bohl, Clear Lake, S. D.; Bennett Medical College, Chicago, 1912; aged 49; died, November 10, in a hospital at Madison, of abscess of the right lung.

Albert J. Foelsch ⊕ Gobles, Mich.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1898; aged 57; died, November 18, of a self inflicted bullet wound.

Harold Lawritz Stolpestad ⊕ St. Paul; University of Minnesota College of Medicine and Surgery, Minneapolis, 1901; aged 54; died, October 18, of heart disease.

Ella Prentiss Upham, Asbury Park, N. J.; Woman's Medical College of Pennsylvania, Philadelphia, 1885; aged 82; died, November 6, of cerebral hemorrhage.

Christian H. Risser, Payson, Ariz.; St. Louis University School of Medicine, 1909; aged 54; died, November 4, in St. Joseph's Hospital, Phoenix, of pneumonia.

James Oettiker, Platteville, Wis.; University of Pennsylvania School of Medicine, Philadelphia, 1878; aged 80; died, October 19, in Shreveport, La., of uremia.

Vincent John Thomas O'Neill, Yonkers, N. Y.; Medico-Chirurgical College of Philadelphia, 1915; aged 48; died, August 29, of aortitis and myocarditis.

James Ernest Browne ⊕ Howell, Mich.; University of Michigan Medical School, Ann Arbor, 1896; aged 66; died, November 16, of cerebral hemorrhage.

Frank Edward Shaykett ⊕ Brandon, Wis.; Rush Medical College, Chicago, 1894; village president; aged 68; died suddenly, November 8, of heart disease.

Elvin Franklin Scheidegger ⊕ Green River, Wyo.; University of Nebraska College of Medicine, Omaha, 1924; aged 40; died, November 4, of influenza.

Elmore W. Le Roy ⊕ Chicago; Hahnemann Medical College of Philadelphia, 1883; aged 73; died, November 26, in Gary, Ind., of cerebral hemorrhage.

William Elder Wolff ⊕ Arendtsville, Pa.; Medico-Chirurgical College of Philadelphia, 1897; aged 64; died, November 3, of coronary occlusion.

Claude H. McMahan, St. Louis; Missouri Medical College, St. Louis, 1899; aged 58; died, November 2, of injuries received in an automobile accident.

Howard Augustus Gallup ⊕ San Luis Obispo, Calif.; Cooper Medical College, San Francisco, 1911; aged 49; died, October 9, of coronary occlusion.

Andrew Blair Nelson, Eastbank, W. Va.; University of Louisville (Ky.) School of Medicine, 1907; aged 52; died, September 18, of heart disease.

Thomas R. Hawkins, Cameron, Wis.; State University of Iowa College of Medicine, Iowa City, 1888; aged 71; died, November 17, of heart disease.

Albert T. Getchell, Mount Pleasant, Mich.; University of Michigan Medical School, Ann Arbor, 1884; aged 77; died, November 15, of heart disease.

Samuel Edward Caldwell, Milan, Tenn.; Vanderbilt University School of Medicine, Nashville, 1889; aged 71; died, November 15, of pneumonia.

Charles Beaver, Detroit; Eclectic Medical Institute, Cincinnati, 1881; aged 72; died, November 10, of epithelioma of the tongue and endocarditis.

John Henry Trent, Marshfield, Ind.; Long Island College Hospital, Brooklyn, 1876; Civil War veteran; aged 86; died, October 19, of myocarditis.

Earl Miller, Detroit; Central College of Physicians and Surgeons, Indianapolis, 1898; aged 61; died, November 22, of carcinoma of the stomach.

Joseph Pryse Sutton, Kitts, Ky.; University of Louisville School of Medicine, 1910; aged 46; died suddenly, November 6, of coronary thrombosis.

George Herbert Small, Bloomington, Ill.; Hahnemann Medical College and Hospital, Chicago, 1903; aged 57; died, October 29, of uremia.

Moses Schonfield ⊕ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1901; aged 53; died, October 23, of coronary sclerosis.

J. M. McLendon, Gould, Ark.; Kentucky School of Medicine, Louisville, 1883; mayor of Gould; aged 74; died, November 20, of carcinoma.

John W. Palmer, Knippa, Texas; University of Tennessee Medical Department, Nashville, 1887; aged 78; died, October 31, of tuberculosis.

Eliza A. Shetter Ray, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1886; aged 71; died, November 20.

D. E. Burrow, Russellville, Ky.; Eclectic Medical Institute, Cincinnati, 1898; aged 58; died, November 14, of cerebral hemorrhage.

Charles L. Van Doren, Urbana, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1881; aged 76; died, October 27.

Herman B. Tihen, Andale, Kan.; University Medical College of Kansas City, 1893; aged 64; died, October 15, of leukemia.

George Hardy Dickinson, Milwaukee; Milwaukee Medical College, 1903; aged 63; died, November 21, of angina pectoris.

Alfred Clark Smith, Columbus, Ohio; Starling Medical College, Columbus, 1898; aged 69; died, November 19, of heart disease.

Anthony Joseph Taugher, Milwaukee; Rush Medical College, Chicago, 1899; aged 61; died, November 1, of heart disease.

Walter B. Parke, Camp Douglas, Wis.; Milwaukee Medical College, 1903; aged 62; died, October 27, as the result of a fall.

Frank B. Bryan, Childress, Texas; Louisville (Ky.) Medical College, 1905; aged 53; died, October 20.

Correspondence

TOXICITY OF EMETINE

To the Editor:—In the review on amebic dysentery in the November 18 issue of THE JOURNAL, in discussing the treatment, the statement is made: "In the chronic cases Craig recommends continuous treatment with emetine bismuth iodide or chiniofon." It is apparent that the writer quoted from my article in Musser's "Practice of Medicine," but in that article it is definitely stated that "in chronic amebic dysentery, during the acute exacerbations the treatment should be with emetine bismuth iodide or chiniofon." It will be noted that continuous treatment with emetine bismuth iodide is not recommended but that the use of this drug is limited to treatment during the acute exacerbations of the chronic type of amebic dysentery.

I would appreciate this statement being corrected in a future issue of THE JOURNAL, as it has apparently caused the impression that I recommend continuous treatment with emetine, which is far from the truth. In all of my writings on this subject I have warned against such continued use of this drug because of its toxic effects and have stated emphatically that it should be used only to control the symptoms of diarrhea during the acute attack of amebic dysentery and that it should never be given to exceed 1 grain a day for a period of twelve days. Usually this dosage of emetine will control the dysenteric symptoms in from five to eight days. I have also repeatedly stated that emetine is of very little value in actually curing cases of amebiasis and for this reason other drugs should be used for this purpose, emetine being relied on only to control the acute symptoms of amebic dysentery, which it does very satisfactorily.

CHARLES F. CRAIG, M.D., New Orleans.
Director, Department of Tropical Medicine, Tulane University of Louisiana School of Medicine.

FAVISM

To the Editor:—The paper on favism by McCrae and Ullery (THE JOURNAL, October 28, p. 1389) interested me greatly. The authors are to be congratulated for their splendid report of their case of hypersensitiveness apparently to the fave bean itself.

My interest in this bean dates back to 1924, 1925 and 1926, during which time I studied and proved clinically and immunologically that the asthma and hay fever of a patient whose symptoms occurred during the spring months were caused by the inhalation of the pollen of the fave bean. It was my feeling that "although this observation was new and original, it was withheld from our journals because it was thought that an isolated case, such as this one, would not prove interesting or important to the American allergists, especially in view of the commonly accepted theory that the pollen of cultivated plants like beans do not cause allergic symptoms." However, in 1929 I chanced to read several articles in the Italian literature describing a condition called "favismo," in which five fatal cases occurred. Realizing that an article on the fave bean would prove more valuable to physicians in southern Italy and Sicily, I submitted my paper to the *Rivista sanitaria siciliana,* which graciously published it last year. I am herewith enclosing a reprint of this paper. The paper was abstracted and published in the March, 1933, issue of the *Journal of Allergy.*

Judging from the text of the paper by Drs. McCrae and Ullery, it does not occur to me that the doctors are actively engaged in the practice of allergy. It would add substantially to our knowledge of the case if the patient had had proper skin tests made. For example, they spoke of making intradermal skin tests using 1 cc. of the bean extract. It is not practical to use more than 0.01 to 0.03 cc. for intradermal testing.

My purpose in this communication is not so much to establish the priority to the discovery that the pollen of this bean is the exciting cause of these severe allergic cases but more to stimulate further study and observation in so-called cases of favism.

In the states of Louisiana and California and also in Canada, where the bean is cultivated to a certain extent, there must be other cases of hypersensitiveness which have not been reported because the physician never associated the pollen of the bean with the cause of the many clinical manifestations of allergy.

SALVATORE J. PARLATO, M.D., Buffalo.

THE AMERICAN MEDICAL ASSOCIATION

To the Editor:—Here is an early prophetic reference to the American Medical Association, found in "Physician and Patient; or, A Practical View of the Mutual Duties, Relations and Interests of the Medical Profession and the Community," by Worthington Hooker, M.D., published in 1849. The reference is found in the chapter on "Means of Removing Quackery":

> The sensible and influential in the community can render effectual aid in the overthrow of quackery, by promoting the strict observance of the rules of medical intercourse. These rules are not officially understood and appreciated by the public. If they were, those who have influence in society would frown down the base arts of a cunning competition, instead of encouraging them, as they now often do, and would give no countenance to the false issues, upon which empirics and dishonorable physicians so much depend for their success. For a full view of this subject I refer my readers to the chapter on the Intercourse of Physicians.
>
> A recent movement of the medical profession in this country, if I mistake not, is destined to exert a great and a permanent agency in the overthrow of empiricism. I refer to the formation of the "American Medical Association" in 1847. Although the meeting in Boston in May last was only the second annual meeting of the Association, so fully did the profession throughout the country respond to the call, that the number of the delegates amounted to about four hundred and fifty. The measures which have already been entered upon, and the spirit which has been manifested, clearly indicate, that the great object for which the Association was formed, "the elevation and advancement of our common calling," will be rigorously and steadily prosecuted. The recurrence of this festival of the profession from year to year, I fully believe, will be marked by real advances in all the interests of medical science.
>
> And now, I ask, is it too much to expect of the stable and well informed in the community, that they will give their countenance to the objects at which we aim? While we are thus struggling together to elevate the standard of medical education, and to rid our noble profession of the abuses which impair its honor and its usefulness, we have a right to demand of the community, which is to be especially benefited by these efforts, a cheerful and active support. Whether this shall be given us, will depend upon the men of influence in every profession and occupation in our land. It is to them that we make our appeal, and we believe that it will not be made in vain.

P. I. NIXON, M.D., San Antonio, Texas.

DE KRUIF WRITES ON PNEUMOTHORAX

To the Editor:—In his address as retiring president of the American College of Surgeons, Dr. C. Jeff Miller (Medical Men and Their Lay Critics, *Surg., Gynec. & Obst.* **54**:391 [Feb.] 1932) quoted Kipling's statement that "doctors always have been and always will be exposed to the contempt of the gifted amateur, the gentleman who knows by intuition everything that it has taken them years to learn." Dr. Miller further charges that "it has perhaps been easier for our traducers to gain a hearing than it has been for our defenders."

In the *Ladies' Home Journal* for November, 1933, these two statements are abundantly confirmed. Paul de Kruif's article "Why Should They Go On Dying?" is a veritable storehouse of misinformation and vilification of the medical profession, as any doctor can see by securing a copy of the magazine and reading it for himself. Briefly, de Kruif had just heard of the collapse therapy of tuberculosis and, in the excitement of his discovery, thinks that because it is useful in some cases of tuberculosis it should be used in all and will save every case if used in time. He charges the medical profession with

"cowardice, ignorance or neglect" (his exact words) because they neglect this life-saving procedure and names only seven places in the United States where it may be obtained—although it has been used in North Carolina since 1913 and there are at least fifteen institutions and twenty-five private practitioners in our state using it as a routine.

In righteous indignation, I wrote a brief letter of protest to the *Ladies' Home Journal,* correcting the most glaring of de Kruif's false statements, and offered it "without money and without price" to its editor—but he coldly declined it.

The late Mr. Curtis, the founder of the company that publishes the *Ladies' Home Journal,* gave to the Jefferson Medical College the magnificent Curtis Clinic, which is perhaps the finest building of its kind in the world. Its purpose is to serve humanity, and it is manned by the same medical profession that is so often vilified by such "gifted amateurs" as de Kruif in the columns of the *Ladies' Home Journal.* I wonder if the policy of the present editor of that magazine would be approved by his dead benefactor.

WINGATE M. JOHNSON, M.D., Winston-Salem, N. C.

VOMITING AND SPINAL ANESTHESIA

To the Editor:—At the Shamokin State Hospital we have been using spinal anesthesia for the past four years (procaine hydrochloride); we consider it the ideal method, obstetrics included, below the diaphragm. We have given 2,000 spinal anesthesias without any fatality; but vomiting occurs almost instantly, particularly in appendectomies when either a hemostat or a ligature is put on the meso-appendix. However, we have changed our technic and before we put either a hemostat or a ligature on the meso-appendix we block the nerves in the meso-appendix with 0.5 per cent procaine hydrochloride and find that vomiting does not occur. This, I believe, is due to the following:

1. The autonomic nervous system of Langley, formed by Gaskell's nerves from the anterior horns of the spinal cord to the great sympathetic ganglions, with the vagus and the pelvic nerve, forms the great thoracic and abdominal nerve plexuses and gives the appendix its nerve supply. We have learned only recently that these nerve fibers are also nerves of sensation.

2. Since the appendix is the only organ in the abdomen having such a well developed nervous system, irritation of this organ is considered a definite indication of chronic appendicitis (Deaver, J. B.: Appendicitis, in the Cyclopedia of Medicine, p. 740).

The nerves of the meso-appendix have no name. Therefore I suggest that they be called Deaver's (J. B.) nerves.

GEORGE W. REESE, M.D., Shamokin, Pa.
Surgeon-in-Chief and Superintendent,
Shamokin State Hospital.

SPINAL ANESTHESIA IN HYPERTENSION

To the Editor:—Dr. Albert S. Hyman (THE JOURNAL, October 28, p. 1410) presents a preliminary statement on the therapeutic use of spinal anesthesia for emergency relief in certain types of hypertension. He says that the depressor effect obtained by spinal anesthesia might be of value when a sudden dropping of the systolic pressure is to be desired and cites a case in which seemingly an imminent cerebral hemorrhage was forestalled by such treatment. He concludes that "in cases of extreme hypertension exhibiting prodromal signs of oncoming apoplexy and with relative grades of anemia, spinal anesthesia may be life saving."

On the other hand, Dr. Stanley Cobb (The Cerebral Circulation: XXV. Remarks on Clinical Physiology, *Ann. Int. Med.* **7**:299 [Sept.] 1933) refers to an article which presents "a strong case for the theory that lowering blood pressure in patients with hypertension and arteriosclerosis may bring on attacks of hemiplegia and aphasia" (Fleming, H. W., and Naffziger, C. H.: Physiology and Treatment of Transient Hemiplegia, THE JOURNAL, Oct. 29, 1927, p. 1484). Cobb adds:

> I have seen several cases where such accidents have occurred after putting arteriosclerotic patients to bed and allowing a systolic pressure to fall from around 220 to about 160, reducing the blood supply to an already poorly oxygenated brain. Moreover, pressure on the carotid sinus causes a sudden fall in blood pressure in some people, and I have seen arteriosclerotic patients in whom such a fall brought on sudden syncope with convulsive movements.

It would seem, because of these diametrically opposed views, that the advisability of lowering the blood pressure in the manner advocated by Dr. Hyman is still considerably *sub judice.*

LOUIS J. BRAGMAN, M.D., Syracuse, N. Y.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

DURATION OF GESTATION

To the Editor:—I recently had occasion to look up the minimal and maximal length of the human gestation period. In De Lee's Obstetrics, the observation is made that Dr. Reichert of Germany has a theory stating that gestation may be complete in 252 days. Is this considered authentic? Please omit name. M.D., Pennsylvania.

ANSWER.—"By the normal end of pregnancy is meant the time at which a normally developed fetus is ordinarily expelled during the process of labor" (Zangemeister). This time, reckoned from the first day of the last menstruation, is accepted as 280 days; calculated from the day of conception, it is 273 days. The exact duration of gestation, that is, from the time the spermatozoon and ovum unite until labor sets in, is not definitely known. However, it is assumed that fertilization takes place on an average about 15.4 days after the beginning of the last menstrual period. Hence the average duration of pregnancy is 280 less 15.4, or 264.6 days. In spite of this, daily experience shows that mature babies are born some time before and after this average number of days. In a series of 187 carefully controlled pregnancies that followed the return of German husbands on furlough during the World War, Nürnberger found that mature children were born between 266 and 282 days after conception in 68.26 per cent, between 258 and 290 days in 95.46 per cent, and between 250 and 298 days in 99.74 per cent. Since in only 0.26 per cent of the cases were mature children born before the two hundred and fiftieth day or after the two hundred and ninety-eighth day, a pregnancy may be considered abnormally short if it lasts less than 250 days and abnormally long if it persists more than 298 days. In Germany, however, the law defines the duration of pregnancy as the period extending from the one hundred and eighty-first to the three hundred and second day before the birth of the child. However, the minimum figure in this law, namely, 181 days after conception, indicates only the period of viability and not the maturity of a child. The French law recognizes the legitimacy of a child born 180 days after marriage and 300 days after the death of the husband (De Lee).

It is assumed that the inquirer would like to know whether a mature child can be born after 252 days of pregnancy. The statement "gestation may be complete" refers to a period of time, whereas maturity deals with a state of development. It is possible for a child to be born after 252 days and show all or most of the signs of children that are normally born at the end of 280 days. According to Haberda, children may be born 238 days after conception, and show all the signs of maturity. On the other hand, children born after the usual 280 days of gestation may not be entirely mature. The best examples of this are the cases of twin pregnancies in which one child is mature and the other is much shorter in length, weighs considerably less and has definite characteristics of immaturity.

DIFFERENTIATION OF EDEMA FLUIDS

To the Editor:—How may the edema fluids in cardiac nephritic and nephrotic patients be differentiated by their protein content? Please omit name.

M.D., Massachusetts.

ANSWER.—A comparison of the results obtained in the chemical analysis of different effusions shows that they vary according to location and according to the disease in which they are produced.

The proportion of protein in edematous fluids in different localities varies in decreasing order as follows: (1) pleura, (2) peritoneum, (3) cerebrospinal, and (4) subcutaneous. Apparently there is a variation in the capillary permeability in these different parts of the body, the pleural vessels being most permeable to protein and the subcutaneous vessels least permeable of the four.

In general, noninflammatory edemas (transudates) contain much less protein than do the inflammatory exudates. Noninflammatory subcutaneous effusions have usually a protein content of from 0.1 to 0.2 Gm. for each hundred cubic centimeters. There is more globulin in nephritic than in cardiac dropsy.

Epstein found that the subcutaneous fluids are totally different in their composition from the abdominal or pleural fluids. The cutaneous effusions are characterized by a very low protein content and a small amount of incoagulable nitrogen. Of the protein present in these fluids the globulin constitutes the greater proportion. In the mixed cardionephritic fluids the ratio of globulin to albumin is lower than in normal blood serum; but when compared with the blood serums of cardionephritic cases there appears to be a certain parallelism.

The effusions in serous cavities have a higher protein content than the subcutaneous. The highest values are found in the pleural fluids, in which the protein content is almost the same as that in normal blood serum. The incoagulable nitrogen in these fluids is low. The abdominal fluids are in general less rich in protein than the pleural effusions. Those of cardiac origin give the highest protein values. In fluid of nephritic origin the protein content is usually low, about on the borderline between transudate and exudate in protein content. Cases of true uncomplicated nephrosis are rare. The effusion in nephrosis is usually extremely low in specific gravity and protein content. The blood proteins are greatly reduced in nephrosis. This reduction is due chiefly to loss of albumin, so that the globulin is relatively increased. In lipoid nephrosis the total blood protein may be as low as 3.9 per cent, of which albumin is 0.5 per cent and globulin 3.4 per cent.

TREATMENT OF BURNS

To the Editor:—About February 18 I saw a patient suffering from burns of both legs extending up to the knees received while stepping in cement. The burns varied from the second to the third degree. The process of healing was slow and unsatisfactory. Trinitrophenol solution, tannic acid solution, trinitrophenol ointment and balsam of peru were all tried to aid the process of healing. At times each seemed to be of benefit and then again seemed to be without benefit. The areas healed over with a thin pinkish skin with a small amount of keloid formation along the edges. This new skin remained soft, pink and tender for some few weeks and did not respond to treatment. Infra-red treatments were instituted and the skin soon assumed a normal appearance. With sudden changes of weather the patient experiences pains in the legs and a discoloration of the burned areas. In walking long distances or exercising the legs, the patient complains of a pulling sensation within the muscles of the leg. This is an industrial case. I would appreciate any information that you can send me that will help me to determine the amount of disability or any suggestions that may be of benefit to the patient and also what the patient may expect in the future as a result of these concrete burns. Will the leg tendons atrophy or will they remain as is? If this is published in THE JOURNAL, please omit name.

M.D., Oklahoma.

ANSWER.—From the description given, it is assumed that skin grafting was not necessary and that there is no interference of motion at the knee or the ankle. This would indicate that the deeper layers of the skin and the underlying tissues were not destroyed. It is probable that scar tissue formation will not grow worse, and there is little likelihood of further limitation of muscular activity as a result. The circulatory disturbance described may be improved by systematic exercises, such as Buerger's exercises, or by the wearing of an elastic bandage. It is stated that the skin is of normal appearance, so it is assumed that excessive keloid formation is not present.

Determination of disability depends on objective observations and a determination of the subjective elements in which the various factors, such as the patient's personality, must be considered. For the purpose of financial settlement, disability following injuries to the leg are based on disability at the knee joint. In some states, total disability at the knee, such as that following amputation, is established at 42.5 per cent of complete permanent disability. It might be established, for instance, that this individual is suffering from a 5 to 10 per cent disability at each knee.

ARTERIOSCLEROSIS IN DIABETES

To the Editor:—My mother has had diabetes for eight years and at present is receiving insulin daily. For the past few months she has been having excruciating pain in the lower part of both lower extremities. She is unable to walk a street block without great discomfort. Can you suggest any treatment, physical therapy or other? Would infra-red rays help any? Any information you care to send will be greatly appreciated. Please omit name.

M.D., New York.

ANSWER.—From the description, the patient is apparently suffering from a restricted blood supply through the lower limbs caused by the rapidly advancing arteriosclerosis typical of diabetes. There may also be an element of vasospasm complicating the picture.

The treatment for this condition is similar to that for Buerger's disease except that it is somewhat more conservative. Buerger's exercises for one hour twice daily followed by half an hour of contrast baths would probably be of benefit. Diathermy to both extremities may also help. This should be done with a plate under the anterior part of the foot and a cuff round the calf muscles. It may be applied to the two extremities at once for about one hour daily.

If further treatment is required, intravenous therapy may be tried. If vasospasm is present, typhoid vaccine is worth trying. One should begin with 24 million organisms intravenously once a week. If no vasospasm is present, one may use from 200 to 300 cc. of hypertonic saline solution (5 per cent) intravenously every second day.

It is not likely that infra-red ray therapy would be of any value.

An article by Samuel Perlow, entitled "Diagnosis and Treatment of Thrombo-Angiitis Obliterans," in the July issue of *Annals of Surgery*, contains an excellent exposition of this subject and a useful bibliography.

SMALLPOX VACCINATION

To the Editor:—My associates and I have had a good many vaccinations to do here lately and my attention has been called frequently to reports that vaccination is being done by hypodermic injection. On inquiry from one of my medical friends, I learn that he has used this method for a number of years. He dilutes the vaccine contained in a tube with 1 cc. of sterile water and injects part or the whole of it hypodermically. Kindly advise me as to the advantages and disadvantages of this method. I note that it is not advised in the literature of the manufacturers with whose products I am familiar. Please omit name.

M.D., Colorado.

ANSWER.—The hypodermic method of vaccination is regarded as objectionable, since satisfactory results are obtained from the method in which the virus is implanted in the skin without resort to subcutaneous injection, and it is believed that it is undesirable to inject hypodermically material which may be infected with organisms other than that of the vaccine.

This method has the disadvantage of not leaving a scar as evidence of a successful take.

We know of no advantage of such a method as is described, in which the vaccine is diluted with 1 cc. of sterilized water and injected hypodermically.

The multiple pressure method, by which the vaccine is introduced subepithelially by means of a sharp pointed needle, is regarded as perhaps the most satisfactory method available.

"DYNAMITE HEAD" OR GLYCERYL TRINITRATE (NITROGLYCERIN) POISONING

To the Editor:—Patients handling dynamite in the bureau of mines frequently claim so-called headaches. This is evidently due to the nitroglycerin. Please let me know if you have any suggestion of treatment as to the causes of these conditions.

MILTON MERMELSTEIN, M.D., McKeesport, Pa.

ANSWER.—This well known condition is familiarly called "dynamite head." These headaches are real and at times severe. Associated with the headache there may be rapid heart beat and flushing of the face; now and then temporary blindness occurs. Gastric disturbances are frequent.

Certain mine explosives, such as nitro-starch, are said to cause no disturbances of this character.

Apparently a tolerance for glyceryl trinitrate (nitroglycerin) is developed in some exposed workers, so long as they are continually, or frequently, in contact with it and so long as exposure is not excessive. After weekends, vacations or other absences from the point of exposure, the headaches are prone to recur.

The imbibing of alcohol increases the probability of the development of "dynamite head." Likewise, alcohol increases the severity of the attack once it is inaugurated.

In order to preserve their "tolerance," some dynamite workers carry about their persons minute fragments of this substance. Children and others in the homes of dynamite workers occasionally develop headache and other manifestations, as the result of the action of dynamite particles accidentally or purposely placed in the clothing of these workers.

The analgesics commonly used to relieve the pain of headache are ordinarily without helpful influence in this abnormal state. This condition is well discussed in Dr. Hamilton's book "Industrial Poisons in the United States," New York, the Macmillan Company, 1929, which contains a brief summary of the literature on this topic.

ALLERGIC TESTS IN PATIENT WITH ARRESTED TUBERCULOSIS

To the Editor:—In an arrested case of tuberculosis is it safe to give the patient the skin tests for allergy? I say arrested advisedly, because the condition probably is still active. The patient's temperature is now normal but she fails to gain in weight, is coughing, and has not gained in strength. Within the last two months she apparently has developed asthma, at least so the sounds in the chest appear. The chest will be perfectly quiet, and without a word of warning an apparent asthmatic attack comes on. In an hour or so it will subside but, as usual in all such cases, returns. The patient is anxious to have the tests, but I was fearful of going ahead with them because I have not had such a case presented before. Please omit name and address. M.D., Illinois.

ANSWER.—Not only are skin tests for the asthma permissible but they are strongly advisable, because they may disclose information that will help the asthmatic condition and prevent a flaring up of the tuberculosis. There is no danger in doing skin tests on tuberculous individuals; however, scratch (cutaneous) tests are advised, at least at first; intracutaneous tests may then be carried out safely if the cutaneous tests are negative.

The combination of bronchial asthma with pulmonary tuberculosis is infrequent and brings up the thought that either the asthmatic symptoms in the patient may be due to a fibroid tuberculosis or bronchial asthma is the sole condition present; i. e., that the symptoms deemed tuberculous might have been from allergic bronchial asthma. History, examination, sputum search, and roentgen examination of the chest should suffice to differentiate. If epinephrine hypodermically gives relief, bronchial asthma is strongly suggested.

KEROSENE POISONING

To the Editor:—I am trying to get some information regarding kerosene poisoning. In a local hospital, during the past five years, there have been seventeen admissions of young children who drank kerosene. There were three deaths and several of the children were acutely ill with high temperature. Can you send me, at your earliest convenience, some information regarding kerosene poisoning or mail me references so I can look up the literature on this subject, as I have been unable to find any so far. C. C. MCLEAN, M.D., Birmingham, Ala.

ANSWER.—Much of the literature pertinent to kerosene poisoning appears under such heads as "gasoline poisoning" and "petroleum-naphtha poisoning." The three substances implied may not act identically, but at least they do act similarly. Four types of damage are known:

(*a*) Dermatitis, which in part is the result of direct irritation, in part the result of the defatting action of these hydrocarbons, and in part the result of "sensitization."

(*b*) Acute poisoning, from the inhalation of vapors, which condition is characterized by cerebral disturbances, frequently termed "naphtha jags." Persons affected behave much like those mildly intoxicated by ethyl alcohol. Excitement is the predominant manifestation. Also in this state there may be disturbances of the digestive tract, with nausea, vomiting and diarrhea. Low grade inflammation of the respiratory tract is well known.

(*c*) An ill defined chronic state is believed to exist. This form of damage resembles multiple sclerosis, plus evidences of damage to the liver, which may result in icterus.

(*d*) The imbibition of any of these substances may lead to prompt severe injury, with characteristic features suggesting impairment of various centers of the central nervous system, plus profound shock.

The following sources may be consulted for additional information:

Henderson and Haggard: Noxious Gases, 1927.
Peterson, Haines and Webster: Legal Medicine and Toxicology, 1923.
U. S. Public Health Service, Industrial Hygiene Division, Washington, D. C.

Dr. Emery R. Hayhurst, 1925 Concord Road, Columbus, Ohio.

OPPENHEIM'S ACOUSTIC EPILEPSY

To the Editor:—Can you give any information as to the condition known as Oppenheim's acoustic epilepsy? M.D., Conn.

ANSWER.—Oppenheim's acoustic epilepsy is described by Hermann Oppenheim in an article entitled Kenntnis der Epilepsie; ihrer Randgebiete (*Ztschr. f. d. ges. Neurol. u. Psychiat.*, Orig. **33**:352, 1918). There is also the following note in Alexander and Marburg's Handbuch der Neurologie des Ohres, Vienna, Urban & Schwarzenberg, 1928, vol. II, part 1, p. 554:

"2. Labyrinth Symptoms and Epilepsy. Hemicrania and epilepsy may exist together or the manifestations may be so closely allied that they present unusual difficulties in diagnosis. However, except for this combination, the distinction between these two diseases will not be difficult (Oppenheim). There is, therefore, a definite basis for associating epilepsy with vascular disturbances without considering epilepsy as a vascular disease."

In this paragraph reference is made to Oppenheim's System of Neurology. However, a study of this system fails to reveal anything more than a mention of the acoustic aura, a differentail diagnosis between the aura and Ménière's syndrome and hemicrania.

CARBOHYDRATE IN INFANT FEEDING

To the Editor:—What is the latest teaching as to the age when carbohydrate should be omitted from a child's milk and he be given just plain milk boiled? What can one do when the child, accustomed to the sweetening of the milk by the carbohydrate, refuses plain milk? Kindly omit name. M.D., Vicksburg, Miss.

ANSWER.—Carbohydrate may be retained in the milk mixture until the child is from 12 to 14 months of age. The carbohydrate as used in infant feeding is a valuable addition to the diet, tends to regulate the bowels, and avoids what may be the present-day tendency to overfeed with cow's milk for too long a period.

THE MILK AND MOLASSES ENEMA

To the Editor:—In "Tonics and Sedatives" in the issue of October 21, J. H. McM. refers to an item of September 16 by Dr. Boggess, calling attention to the use of the milk and molasses enema. At first I was at a loss to see the point of the joke in this comment, as I could not see the "highly descriptive simile"; but at length it dawned on me what J. H. McM. was driving at that gave him such a hearty laugh, so let's carry the fun a little further.

Now I want to defend Dr. Boggess, not only in his use of the milk and molasses enema, but also in his English. When one sets himself up as a critic in the use of English as does J. H. McM., he should set a good example in English himself. He calls this reference a "simile." I am unable to see such a figure of speech. A simile is a comparison of dissimilar objects or things by the use of "like" or "as." For instance, we would say "Washington stood as a mighty oak in the political storms of his day." Dr. Boggess employs another legitimate rhetorical figure of speech known as metonymy, in which one word does duty for another. For example, we say that "a man keeps a good table" instead of "a man keeps good food on his table." Now it is perfectly legitimate to say that Dr. Senn brought back the "efficacy" of a milk and molasses enema. This is a metonymy in which the word "efficacy" does duty for the term "report of efficacy." The English language is full of such expressions and it is considered good usage.

Possibly the most benefit that may be derived from this friendly discussion is to call especial attention to the usefulness of this enema in cases of paralytic ileus or similar conditions in which other drugs and methods are found futile. I have seen gratifying results on various occasions when all other helpful remedies, such as drugs, high soapsuds enemas and double strength solution of pituitary, have failed. In a recent case of hemiplegia in which I was associated, all efforts to secure a bowel movement, for eleven days following the stroke, were unsuccessful. On the twelfth day the milk and molasses enema was employed, resulting in immediate evacuation. Therefore it will be clearly understood why the recent discussions of August 19, September 16 and October 21 attracted my attention.

HUGH MILLER, M.D., Kansas City, Mo.

ALLERGY AND FEVER OF UNKNOWN ORIGIN

To the Editor:—The answer to the question on "Fever of Unknown Origin in Childhood" in THE JOURNAL, October 21, page 1336, fails to consider the possibility of food allergy. In fact, this etiology is rarely if ever mentioned in any article on idiopathic fever. Various students of food allergy have emphasized the necessity of remembering that food sensitizations may be responsible for intermittent or prolonged elevation of temperature both in young and in adult life when other recognized causes of fever have been excluded or therapy based on such causes has failed to relieve the fever. These references and my personal experiences have been recorded in my book on "Food Allergy" (Philadelphia, Lea & Febiger, 1931), and since then further clinical confirmations have multiplied in regard to this cause. The patient's personal and family history may or may not be positive for allergy, and evidence of food dislikes or disagreements may or may not be present. "Elimination diets" modified by definite skin reactions or histories of food dislikes or disagreements should be tried as a diagnostic procedure.

ALBERT H. ROWE, M.D., Oakland, Calif.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 9-13. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

AMERICAN BOARD OF OPHTHALMOLOGY: Cleveland, June 11. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Cleveland, June 11. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

ARIZONA: Phoenix, Jan. 2-3. Sec., Dr. J. H. Patterson, 320 Security Bldg., Phoenix.

COLORADO: Denver, Jan. 2. Sec., Dr. Wm. Whitridge Williams, 422 State Office Bldg., Denver.

DISTRICT OF COLUMBIA: Washington, Jan. 8-9. Sec., Dr. W. C. Fowler, 203 District Bldg., Washington.

HAWAII: Honolulu, Jan. 8-11. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.

ILLINOIS: Chicago, Jan. 23-25. Supt. of Regis., Dept. of Regis. and Edu., Mr. Eugene R. Schwartz, Springfield.

MINNESOTA: *Basic Science.* Minneapolis, Jan. 2-3. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Regular.* Minneapolis, Jan. 16-18. Sec., Dr. E. J. Engberg, 350 St. Peter St., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS: The examinations will be held at centers in the United States where there are five or more candidates, Feb. 14-16, May 7-9, June 25-27, and Sept. 12-14. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEBRASKA: *Basic Science.* Lincoln, Jan. 9-10. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 29-Feb. 1. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, Room 315 Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 2. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OREGON: Jan. 2-4. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

PENNSYLVANIA: Philadelphia, Jan. 2-6. Sec., Mr. W. M. Denison, 400 Education Bldg., Harrisburg.

RHODE ISLAND: Providence, Jan. 4-5. Dir., Dr. Lester A. Round, 319 State Office Bldg., Providence.

SOUTH DAKOTA: Pierre, Jan. 16-17. Dir., Dr. Park B. Jenkins, Pierre.

TENNESSEE: Memphis, Dec. 21-22. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

WASHINGTON: *Basic Science.* Seattle, Jan. 11-12. *Regular.* Seattle, Jan. 15-16. Dir., Mr. Harry C. Huse, Olympia.

WISCONSIN: Madison, Jan. 9-11. Sec., Dr. Robert E. Flynn, 401 Main St., LaCrosse.

Rhode Island October Report

Dr. Lester A. Round, director, Public Health Commission, reports the written and practical examination held in Providence, Oct. 5-6, 1933. The examination covered 7 subjects and included 70 questions. An average of 80 per cent was required to pass. Fourteen candidates were examined, all of whom passed. Three physicians were licensed by endorsement. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Yale University School of Medicine		(1931)	80.1
Georgetown University School of Medicine		(1933)	90.8*
Tufts College Medical School		(1932)	81.5, 83
Detroit College of Medicine and Surgery		(1929)	87.5
St. Louis University School of Medicine		(1933)	84.4*
Hahnemann Medical College and Hosp. of Philadelphia		(1932)	81.1, 84.7, (1933) 81.7,* 82.6,* 86.1*
University of Toronto Faculty of Medicine		(1925)	80
Laval University Faculty of Medicine		(1925)	84.2
McGill University Faculty of Medicine		(1931)	84.3

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Boston University School of Medicine		(1932)	N. B. M. Ex.
Cornell University Medical College		(1927)	N. B. M. Ex.
University of Toronto Faculty of Medicine		(1930)	N. B. M. Ex.

* License withheld pending completion of internship.

California Reciprocity and Endorsement Report

Dr. Charles B. Pinkham, secretary, Board of Medical Examiners of the State of California, reports 19 physicians licensed by reciprocity and 5 physicians licensed by endorsement from Sept. 6 to Oct. 25, 1933. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine		(1932)	Colorado
Northwestern University Medical School		(1928)	Missouri
Rush Medical College		(1928)	Illinois
University of Illinois College of Medicine		(1926) (1931)	New York, Illinois
Indiana University School of Medicine		(1932)	Indiana
University of Maryland School of Medicine and College of Physicians and Surgeons		(1932)	Maryland
Tufts College Medical School		(1927)	Michigan
University of Michigan Medical School		(1927)	Michigan
University of Minnesota Medical School		(1928)	Minnesota
St. Louis College of Physicians and Surgeons		(1895)	Utah
Creighton University School of Medicine		(1924)	Nebraska
University of Nebraska College of Medicine		(1928)	Mississippi
University of Cincinnati College of Medicine		(1922), (1924)	Ohio
University of Pennsylvania School of Medicine		(1929)	Minnesota
University of Tennessee College of Medicine		(1931), (1932)	Tennessee
University of Alberta Faculty of Medicine		(1929)	Minnesota

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1931, 2)	U. S. Navy
Columbian University Medical Department, D. C.		(1902)	U. S. Army
Harvard University Medical School		(1894)	U.S.P.H.S.
Washington University School of Medicine		(1928)	N. B. M. Ex.

Book Notices

Maternal Mortality and Morbidity: A Study of Their Problems. By J. M. Munro Kerr, M.D., F.R.F.P.S., F.C.O.G., Regius Professor of Midwifery, University of Glasgow. Cloth. Price, $8.25. Pp. 382, with illustrations. Baltimore: William Wood & Company, 1933.

Seldom does one find a book that is so full of useful information. This fact also makes the book difficult to describe. Unlike monographs on the subject, it contains a mass of statistics gathered in Great Britain and other countries, together with a great deal of general information on the subject of maternal mortality and morbidity, with a wise interpretation of both as they relate to conditions in actual practice and to the agencies committed to their improvement. It is most convenient to have all this knowledge put together in one handy volume with a well worked out table of contents and an excellent index. After a bird's eye view of the situation in Britain by the author, there is a general review of the conditions affecting mortality by Dr. P. L. McKinley. The statistics of the maternal death rate are presented and the bearing that infections, operative procedures, and abortion have on it is clearly presented. An intriguing chapter on maternal morbidity and subsequent disablement, by Donald MacIntire, contains stimulating facts. The prevention of maternal mortality and morbidity and the various obstetric services, their design, organization and staffing, are fully treated. Nowhere will the American student find a more comprehensive review of home or "domiciliary" obstetrics. After reading these chapters he will be rudely awakened and impressed, the results of home obstetrics are so good. Of most interest to Americans will be the attitude toward the midwife. Whereas in America we are trying to get rid of this profession, in Britain the midwife looms large in all the discussions; indeed, there is a most pronounced reactionary trend toward her employment. A full description cannot be given here, but the reader can gain an idea of the midwife's status in Britain from the statement that "no one can give the medical student better training in normal labor than the experienced midwife." Excellent chapters are devoted to a transport obstetric service and to the education of medical students in obstetrics and gynecology, in which a combination of the two disciplines is recommended. The ideal maternity hospital is described and architectural plans are submitted. One sees from these that the British still cling to the old notion of a delivery room as a somewhat improved bedchamber, while the operating amphitheater is regally furnished with surgical appurtenances. What will strike the reader with great astonishment is the demand that a maternity hospital should consist of "three separate blocks, separated by wide air passages, which is preferable to isolation in flats." The author demands "a clean block," "a suspect block" and "a septic block unless provision for septic cases is made elsewhere." Thus this British authority is more meticulous than the most rabid American isolationist. Valuable instruction is given for the formation of a national maternity service, and the book ends with an appendix which gives consideration to the topics of the toxemias of pregnancy and the relations of general medical practice to the medical curriculum. The results of the Queen's Institute of District Nursing are presented and they are most gratifying. National health insurance and maternity has not yet received the attention in this country that it has in Britain. This book demands a place on the reading table of every obstetrician and public health officer.

Die experimentelle Pharmakologie als Grundlage der Arzneibehandlung. Von H. H. Meyer und R. Gottlieb. Eighth edition revised by Prof. Hans H. Meyer and Prof. Dr. Ernst P. Pick. Paper. Price, 30 marks. Pp. 813, with 98 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1933.

Since its first appearance almost twenty-five years ago, this treatise has kept its position in the front rank of works on pharmacology. Eight years ago, when the preceding edition was published, the passing influence of the venerable senior author, Meyer, who has officially retired from the chair of pharmacology in Vienna, was lamented. But despite his advanced years he has presented with the aid of associates in the present edition a complete revision of the former book by Meyer and Gottlieb. A considerable portion of the work of revision was done by Prof. E. P. Pick, the senior author's co-worker of many years and the present head of the Viennese pharmacologic institute, who himself has completely rewritten the chapter on circulation, probably the best chapter in the present book.

Although extensively rewritten, this edition nevertheless has all the earmarks of the previous editions of Meyer and Gottlieb. For instance, the treatment of the subject matter of pharmacology is still the same, that is, according to physiologic systems, whereas most other textbooks follow the old Buchheim classification according to groups of drugs with predominant actions. Neither classification is perfect; the physiologic imposes a certain amount of repetition of a drug's actions, and the drug classification a repetition of physiologic functions. But in the present edition by Meyer and Pick the tendency to scatter the discussion of the actions of a drug is less evident than in previous editions.

Each chapter is introduced with a sketch of the physiology of the function or system under consideration, followed by chemical data on the composition and structure of the drug or poison. Then follow the data on the drug's actions and their physiologic correlations and significance, through which the mechanism of the action may be understood. Clinical data and experiences are correlated and integrated with the experimental whenever possible to complete the picture. Differences from experimental data are indicated and gaps or deficiencies in evidences pointed out. Thus the book truly seeks to lay down a definite, objective basis for therapeutic and other uses for drugs in medical practice. Certain drugs are discussed for their sole usefulness as reagents in the study of living functions and tissues, but the same is done with all other agents whenever feasible. In this way the authors signally justify pharmacology as a branch of experimental biology. Originality, objectivity and directness characterize the sources of information. Opinions, views and theories, especially those quoted or adopted by scientific writers from the published works of others, the authors state, have not been included. Only those theories and views have been considered which have been published in original papers, reprints or books, but not those of textbooks. There is adequate evidence of this practice in the extensive citations of original works of numerous investigators.

The present edition is complete as to all essential phases of the subject. The latest advances have been worked into the text or into many footnotes. While the discussions of the newer developments are not always as comprehensive as might be desired—sometimes there being merely a reference to a new point of view or result—there is nevertheless a comprehensive listing of the newer researches and advances in the world's literature on pharmacology to the end of 1932. As much cannot be said of most books in the English language, even of some of the best. The works of American pharmacologists are given liberal recognition and prominence, which will come as a pleasant surprise to many colleagues in this country, since the same cannot be said of some American and English books.

Some important and interesting passages, which will testify to the freshness of the book in dealing with researches from all quarters and give to American readers some indication of the esteem by foreigners of the work of their countrymen, may be listed as follows: Bancroft's colloid theory of narcotic action is mentioned, but also its critical rejection by V. E. Henderson and Lucas. Carbon dioxide is useful in catatonia, as advocated by Loevenhart. Concerning substitutes in narcotic addiction, the euphoristic action fails with codeine, paracodeine and ethylmorphine hydrochlorides; but diacetylmorphine is especially euphoristic. Dilaudid, encodal and diiodide all cause euphoria and awaken a desire in man for repeated doses, which should interest physicians in view of the advertising campaigns on opium substitutes. The interesting work of Burridge on physiologic states affecting pharmacologic actions, scarcely noticed in other textbooks, is included. The extensive researches of Heymans and his collaborators during the past ten years on reflexes as physiologic factors controlling the respiratory and circulatory functions, and in pharmacologic reactions, are extensively discussed; also, Heymans' work on pyrexias and metabolic actions from methylene blue and dinitronaphthol. Well done is the chapter on sleep and hypnotics, which expounds the newer classification of hypnotics according to their seats of action in the brain, especially investigated by Pick. Reference is made to work of Hastings on bromide. In the chapter on anesthesia, reference is made to Leake's well known lecture on the history of anesthesia and work on anoxemia; to Henderson and Haggard's work on gases; to ethylene of Brown and Luckhardt, which is disposed of in five sentences; but acetylene, more popular with Germans, is given eleven sentences, in which it is stated that anesthesia occurs without injury to metabolism. Propylene and cyclopropane of V. E. Henderson are briefly discussed, but the theory of anesthesia gets fifteen pages, all in small print and highly interesting. All the old and new work on local anesthetics, including the recent review by Hirschfelder and Bieter, receive attention. Even American names for foreign products are included, such as "nupercaine" for "percaine," indicating that every detail seems to have been thought of by the authors. The description and diagrams of the autonomic nervous system remain a classic and include the extensive work of Tainter, Hamet and others on the sympathomimetic amines and the classification of these drugs according to results on ergotoxinized and cocainized animals and tissues. The humoral transmission of vagotropic and sympathotropic substances, such as histamine and epinephrine, as developed in the works of Loewi, Dale and his associates, Cannon, and others are extensively discussed. Atropine, for instance, is stated to act on the Auerbach-Meissner plexuses, to paralyze vagi and to act on choline and other hormones and poisons; to correct the atonic bowel by stimulation of myenteric plexuses and to rest the intestine by depression of vagus and pelvic nerves—all of which indicates something of the authors' ingenuity for correlating fundamental data with practical applications. In the chapter on the pharmacology of genitalia, the "virilizing action" of the suprarenal cortical hormone is credited to Holmes and Goldzieher and Rowntree. Theelin of Doisy and products of Lacqueur from the ovary, "Voegtlin powder" of pituitary, and oxytocin and vasopressin of Bugbee and Kamm come in for their share of mention. Apiol is stated to be used commonly as an abortifacient but often adulterated up to 50 per cent with tricresylphosphate, the constituent of "ginger" in this country, which causes neuritis, thus recognizing some of the best pharmacologic work done recently in the United States by M. I. Smith.

Probably the most comprehensive and best chapter in the book is that on the circulation, which considers at length the important principles governing cardiac filling and output of blood, blood distribution, and relative importance of vascular and cardiac factors, in which the rôle of the liver and other splanchnic viscera, but especially the hepatovenomotor mechanism, is emphasized. This naturally leads up to a discussion of digitalis and its actions, including the opposite effects on cardiac output in health and disease. The latter have been the object of considerable recent discussion and are best explained by the significant work of Dock and Tainter, who demonstrated the importance of hepatic vein constriction in the peripheral vasomotor action of this drug. The same mechanism has wider applications, since through it are mediated definite effects on blood circulation and distribution in different species, including man, according to Bauer, Dale, Poulsson and Richards. The newer methods of measuring blood flow with ethyl iodide (Yandell Henderson), with acetylene (E. K. Marshall), and with the thermal galvanometric technic (Rein) are all considered. Repeated attention is drawn to the relationship of splanchnic and hepatic vein reactions to blood circulation and distribution from other drugs, but especially histamine, epinephrine, nitrites and choline. Hanzlik's pigeon-emesis method of bio-assay and studies of digitalis emesis by Dresbach and Waddell and Hanzlik show that the seat of action is probably peripheral in the liver and other viscera and not in the heart as originally thought by Hatcher. Febrile patients tolerate high doses of digitalis better than do normal men, owing to increased detoxication and more rapid destruction of glucosides in the blood, muscle and liver; twice the fatal dose can be tolerated by febrile cats. Doses of digitalis at high altitudes should be reduced, according to Macht. The palatability of infusion of digitalis can be increased by prescribing with it dilute hydrochloric acid. In rectal clysmas the dose of digitalis must be from 0.5 to 1 Gm. of the leaves or from 50 to 60 cc. of infusion, given as single doses. In France, sparteine is commonly used to slow the pulse in exophthalmic goiter, typhoid and chloroform anesthesia, so as to rest the heart, but it is not a digitalis substitute.

Mentioned or discussed are the recent researches of Stewart and Rogoff, Hartman, and Swingle and Pfiffner on suprarenal cortical extracts; of Chou and Sollmann on cardiac strips; of Sollmann and his associates on intestinal contraction; of von Oettingen on bismuth and other drugs investigated for their fundamental bearings in pharmacology; of Tatum and associates on barbitals; of Plant on morphine and other drugs on the intestine; of Barbour on antipyretics; of Harvey Cushing's peculiar effects from intraventricular (intracerebral) injection of pituitary and pilocarpine; of Munch on thallium; of Kendall and of Harrington on thyroxine, and of many others on diverse subjects. Yohimbine and ergotoxin are described together; the former dilates genital vessels, while the latter contracts most vessels. Yet both drugs reverse the blood pressure actions of epinephrine. The principal respiratory stimulants are summarized in this order: camphor, hexetone, cardiazole, coramine, caffeine, euphylline, atropine and lobeline. Theories of urine secretion are discussed in the chapter on diuretics, including the works of A. N. Richards, E. K. Marshall, Jean Oliver, Molitor and Pick. Calomel and organic mercurials are said to possess dehydrating actions on tissues, and it is probable that less soluble nonionic mercury compounds act as weakly soluble albuminates with specific dehydrating actions.

In the discussion of salt and ionic actions, an interesting suggestion is made regarding the comparative actions of the chlorine, bromine and iodine ions. Chlorine is not oxidized, but hydrobromic and hydroiodic acids (also iodide) are; therefore, the latter have specific molecular

actions and it is not correct to speak of anionic or ionic actions of iodine. For, if there were merely ionic actions of these halogens, iodide and bromide should act like the indifferent chloride, which is not the case. It is considered that carbon dioxide of the body may provide high enough acidity to permit formation of hydroiodic acid. The newer concepts of chemical and dynamic cycles in muscular work and the peculiar iodoacetic action of Lundsgaard are reviewed. In cyanide poisoning, sodium tetrathionate is a more powerful antidote than sodium thiosulphate. There is no mention of methylene blue and sodium nitrite, which are now known to be superior. Treatment of this poisoning requires attention to two principles: first, mechanical and, second, chemical. For resuscitation, mechanical respiration is to be kept up until the poison is detoxicated; for detoxication, intravenous injection of thiosulphate, intramuscular injection of "detoxin" (a sulphur splitting albuminate), or intravenous injection of dextrose or "oxantin" (hydroxyacetone), according to the recent work of Forst.

Surprising, doubtful or objectionable to most pharmacologists, at least in this country, will be the following statements in the book: Listed with oxidizing antiseptics is potassium chlorate, which is stated to give off oxygen slowly in the body; the detoxicating action of strontium thioacetate is superior to sodium thiosulphate; action of salicylates is generally held to be etiotropic in rheumatic fever; tribrom-ethanol is an intravenous anesthetic for short operations; mention of valerian and a number of commercial esters of valerianic acid as hypnotics; "veramon" is a chemical union of barbital and amidopyrine which can act as such in the body; mention of no less than twelve coronary vasodilators for use in angina pectoris, the biggest surprise being yeast extract, by mouth, and others almost as surprising being adenylic acid, kallikrein and related tissue products, hypertonic sugar solution, and digitalis glucosides, but yohimbine and barbitals are perhaps more rational; papaverine intravenously for migraine; synephrine in asthma, hay fever and hypotonus; cardiazole (metrazole) as an inhibitor of intestinal colic, bronchial asthma and as an expectorant; acetylsalicylic acid is not exactly the same thing as aspirin as to melting point and composition according to commercial tests, for which authority is cited; rather extensive mention of trademarked products in the text, though generally not without giving the chemical composition. Antisyphilitic remedies are discussed too briefly, in view of their therapeutic importance. For instance, mercury gets two pages, and bismuth only nine sentences, not entirely acceptable, with mere citation of papers by Masson and von Oettingen. The reason is that bismuth is not popular in Germany and Austria.

However, the matter which might be questioned, or objected to, in this book is comparatively small in amount and minor. Any weaknesses are greatly outweighed by many excellent features and by the active interest and preeminence in pharmacology of its authors, which gives it the weight of authority. This book is truly representative, international in scope, impersonal, and eminently fair to all those who profess and are identified with pharmacology. It is exceedingly stimulating and leaves a favorable impression of the value and importance of pharmacology, which brings to mind some comments on this subject. Once a prominent pharmacologist was asked by a biochemist in this country "What is to become of pharmacology?" and was told by a prominent medical dean "There is hardly any such thing as pharmacology; it is only biochemistry and therapeutics and we shall have the subject taught by a young man on patients in the wards." Some physiologists have said that pharmacology is only a branch of physiology and not only regret but even defy its separation. A prescription for these skeptics and pessimists is a tolerable familiarity with Meyer and Pick. Here they will find the really active and productive pharmacologic talent of this country, well recognized for its contributions to and achievements in one of the most progressive of the world's medical sciences today. A desk copy of this book is indispensable to every pharmacologist and researcher in medicine, and no physician, physiologist, biochemist or medical student should regard his library complete without it. It is to be hoped that Prof. V. E. Henderson will again render this edition into English, for Meyer-Pick is really a great work, which should not escape those who cannot read it in the original.

The Occipito-Posterior Position: Its Mechanism and Treatment with a New Conception of the Rôle of the Pelvic Floor. By Roland Beard, M.C., M.B., B.S., Gynaecologist, Adelaide Hospital. Paper. Price, 3/6. Pp. 36, with 4 illustrations. Adelaide: F. W. Preece & Sons, 1933.

This interesting monograph presents a somewhat new view on the mechanism and treatment of this condition based on an analysis of more than 3,000 cases from the Queen's Home in Adelaide, together with the author's study of the pelvic floor. His concept of the rôle of the pelvic floor in the mechanism of the occipitoposterior position is based on the fact that he divides the pelvic floor into two functional groups: (1) projection group, iliococcygeus and ischiococcygeus, and (2) rotation group, the pubococcygeus of either side. He formulates a new law: "With the lie longitudinal, that portion of the presenting part which is related to the anterior segment, the pubococcygeal portion of the pelvic floor, rotates to the symphysis." He divides posterior positions into two groups: the true occiput posterior, with the occiput at the sacro-iliac joint, and the intermediate occiput position, with the occiput anterior to the sacro-iliac joint. He believes that these positions can be differentiated clinically and that, while descent of the head has significance, flexion plays no part. Failure to rotate is due to the pelvic floor function. He is further convinced that anterior rotation through three eighths of the circle is rare.

Medicolegal

Medical Practice Acts: Notice and Opportunity to Be Heard Before Revocation of License; Moral Turpitude Defined.—Tullidge was a licentiate of the state board of medical examiners of Florida. It was charged that he violated his oath when he applied for a license to practice medicine, in that he swore that he had never been convicted of a crime involving moral turpitude. He had been convicted by a court-martial, it was alleged, of "scandalous conduct tending to the destruction of good morals," preferred against him when he was an assistant surgeon in the United States naval reserve force. The board fixed a time and place for a hearing on the charges. Without notice to Tullidge and without affording him an opportunity to be heard in his own defense, the board proceeded. It had before it a transcript of the evidence against Tullidge at the time of his trial by court-martial, the finding of the judge advocate, and the sentence of the court-martial, together with certain testimony having no relation to the present charges. Notwithstanding a request by counsel for a continuance, it having been shown that he was out of the state, that his address was unknown, and that he had never been personally served with a copy of the charges against him, the board peremptorily struck Tullidge's name from the roll of those licensed to practice medicine. Thereafter Tullidge instituted an original proceeding in the Supreme Court of Florida for a writ of mandamus to compel the board to restore his license, and the Supreme Court allowed the board ten days within which to show why such a writ should not issue.[1] The board filed its answer, contending that the members of the board were very busy men, needed at home by their patients, and that the evidence against Tullidge was so conclusive that no good purpose could have been served or different result reached had Tullidge been notified of the hearing and given an opportunity to resist the charges preferred against him.

All this may be true, said the Supreme Court, but the matter of depriving a person of his means of support should be considered seriously. The board of medical examiners is vested with this grave responsibility and is required to give due consideration to the rights of the accused before condemning him. The law prescribes specific requirements for doing this. If those requirements are not followed, the law is meaningless and is no longer a rule of conduct to govern the high and the low alike. We do not hold, said the court, that legal service cannot be made by registered mail or that the accused can ignore or run away from such service with impunity, but we do hold that the board has no right to proceed to the examination of a cause before it has positive proof that service has been made on the accused and reasonable time given him to employ counsel and to prepare his defense.

Tullidge contended that the charge on which his license was revoked was not warranted by law and that the charge of "scandalous conduct tending to the destruction of good morals" for which he was court-martialed was not a charge involving moral turpitude as contemplated by the law under which his license was revoked. Moral turpitude, said the court, involves the idea of inherent baseness or depravity in the private social relations or duties owed by man to man or by man to society. It has also been defined as anything done contrary to justice, honesty, principle, or good morals. It often involves, however, the question of intent, as when an act is unintentionally committed through error of judgment, when no wrong is contem-

1. State ex rel. Tullidge v. Hollingsworth (Fla.), 138 So. 372; abstr. J. A. M. A. **99**: 588 (Aug. 13) 1932.

plated. The question whether Tullidge might have defended himself on the ground that the charge on which his license was revoked was not warranted by law or that the offense for which he had been convicted by court-martial was not an offense involving moral turpitude was not, however, presented in such form as to authorize the Supreme Court to express an opinion.

Tullidge's petition for a writ of mandamus directing the board of medical examiners to restore his license was granted. —*State ex rel. Tullidge v. Hollingsworth (Fla.), 146 So. 660.*

"Poisoning" in Relation to Insurance Construed.—The defendant insurance company insured the life of one Urian. The policy provided for the payment of double indemnity to his widow if the death of the insured was caused by external, violent and accidental means, other than "poisoning." The insured accidentally inhaled carbon monoxide while working on his automobile and death followed. His widow sued for the double benefits payable in event of accidental death, ignoring the provision of the policy that relieved the insurer of the payment of such increased benefits if accidental death resulted from poisoning. Judgment was given in her favor, and the insurer appealed to the Supreme Court of Pennsylvania.

According to the trial court, ordinary persons, in using the word "poison," have in mind something taken into the stomach, not germ poisons, disease poisons nor gas poisons; the word "poisoning" was used in the policy to mean something taken through the mouth into the stomach; the parties making the contract did not contemplate poisoning by gas; and the word "poisoning" refers to a deliberate act, not to the taking of poison accidentally. But with these conclusions of the trial court the Supreme Court did not agree. According to the weight of authority, said the Supreme Court, the taking of poison by accident or mistake is within the meaning of an exception relieving an insurer from liability as much as is the taking of poison by design, although some cases hold the contrary. When an insurance policy is clear and unambiguous and names as a condition exempting the insurer from liability something that is simply a potential cause of injury or death, and makes no reference to any possible act or possible omission by the insured or any other person in relation to that cause, either intentional or unintentional, and when injury or death results from that cause, no recovery can be had under the policy, unless there is in it some other provision authorizing such recovery. The judgment of the trial court in favor of the beneficiary was reversed, so far as it required the payment of double benefits.—*Urian v. Scranton Life Ins. Co. (Pa.), 165 A. 21.*

Insurance: Total Disability Defined.—The plaintiff sued the defendant insurance company on a policy which provided certain benefits if the plaintiff should suffer disability wholly preventing him from engaging in any business or occupation or performing any work for compensation. The insurance company contended that, even if the plaintiff was unable to perform his usual business, he could not recover unless there was evidence that his disability prevented him from carrying on any kind of work for compensation. Disability clauses, said the Supreme Court of Arkansas, do not define disability in such a way that the insured must become helpless before he can claim the benefits under them. Such disability is meant as renders him unable to perform all the substantial and material acts of his business or the execution of them in the usual and customary way.—*Guardian Life Ins. Co. v. Johnson (Ark.), 57 S. W. (2d) 555.*

Evidence: Admissibility of Statements Made by Examinee to Examining Physician.—A physician can testify as to symptoms and conditions of injury or disease made known to or discovered by him in treating his patient. But when an injured person, for the express purpose of qualifying a physician to testify in his behalf in a personal injury suit, makes statements as to subjective pain and suffering, not disclosed to the physician by other and independent means, there exists both motive and opportunity for the patient to magnify or feign. Under such circumstances the statements of the patient are clearly self-serving, and hearsay and should not be admitted in evidence.—*Gaines v. Stewart (Texas), 57 S. W. (2d) 207.*

Society Proceedings

COMING MEETINGS

American Academy of Orthopedic Surgeons, Chicago, Jan. 8-10. Dr. Philip Lewin, 104 South Michigan Blvd., Chicago, Secretary.

Society of American Bacteriologists, Philadelphia, Dec. 27-29. Dr. James M. Sherman, Cornell University, Ithaca, N. Y., Secretary.

CENTRAL SOCIETY FOR CLINICAL RESEARCH

Sixth Annual Meeting, held in Chicago, Oct. 27 and 28, 1933

The President, DR. M. A. BLANKENHORN, Cleveland, in the Chair

Food Sensitization Dermatoses (Eczema)

DR. CLEVELAND J. WHITE, Chicago: Specific food or foods have been found to be of either primary or secondary etiologic importance in 128 out of 487 cases of so-called eczema. Thirty-four were treated with the specific food propeptan. It was of decided benefit in 85 per cent but of no value or produced an urticarial or symptomatic flare up in the remainder. In this study the clinical manifestations of food sensitization dermatoses were reviewed and the importance of cutaneous food tests and elimination diets discussed.

DISCUSSION

DR. LEE FOSHAY, Cincinnati: I should like to inquire whether propeptan is used only once and whether immediately after the exclusion of the sensitizing foods from the diet.

DR. CLEVELAND J. WHITE, Chicago: The propeptan therapy is well discussed in Urbach's book, which has been translated into English by Dr. F. M. Schmidt of Chicago. The specific food propeptan tablet is taken forty-five minutes before eating a portion of the food itself. This amount is regulated by the presence of any eruption following this ingestion. My criticism of the propeptan is the almost total ignorance of its method of preparation. I believe that eventually we shall be able to prepare our own specific food peptones, thus making it economical enough to be used on a larger scale when such desensitization is necessary.

Influence of the Liver on the Metabolism of Bile Acids

DR. J. L. BOLLMAN, Rochester, Minn.: Bile acid excretion has been studied under several experimental conditions. The excretion of bile acids in the bile collected by the external fistula of Rous and McMaster or by choledoco-ureterostomy is quite constant day by day. It is little influenced by diet. Almost quantitative recovery of bile acids administered by vein or by mouth is obtained within twenty-four hours. Small amounts of certain toxic substances—chloroform, carbon tetrachloride and tetrachlorethane—which specifically damage the liver cause a marked decrease in the excretion of bile acids without producing any other evidence of hepatic dysfunction. Ligation of the common bile duct causes urinary excretion of bile acids in almost constant amounts daily. This amount, however, is only about half of that excreted by dogs with external biliary fistulas. The normal animal appears to be able to destroy large amounts of bile acids, since large amounts may be fed over long periods without the appearance of bile acids in the urine or feces. Bile acids fed or injected into animals with obstructive jaundice are only partly recovered in the urine. After complete removal of the liver the administration of bile acids is followed by the excretion, in the urine, of the complete amount of bile acid given. The liver appears to be the site of destruction of bile acids in the body. Bile acids, unlike bile pigment, do not appear in the blood or urine following complete removal of the liver. The significance of this fact is doubtful, since there is a similar depression of bile acid formation following the performance of a biliary fistula or ligation of the common bile duct.

DISCUSSION

DR. M. A. BLANKENHORN, Cleveland: Dr. Bollman answered the question that I would ask, as to the aid in differentiating

intrahepatic and extrahepatic causes of jaundice. It has always appealed to me as a likely aid. I should like to ask Dr. Bollman whether or not in obstructed animals, with the common duct tied, the feeding of bile salts has added to the intoxication that might be analogous to chloremia. That point comes up in the matter of the giving of ox-gall to patients. I should like to ask whether his work has made any contribution to that point.

DR. G. O. BROUN, St. Louis: I should like to ask what method of extraction of blood was used to carry out the test for bile salts.

DR. SIDNEY A. PORTIS, Chicago: I should like to ask Dr. Bollman whether, coincidentally in his experiments of biliary fistula and the feeding of bile salts, he noticed any increase in the excretion of bile following the feeding of bile salts.

DR. J. L. BOLLMAN, Rochester, Minn.: In reference to the chairman's question about the feeding of bile salts having any effect on the clinical well being of the animal, I have given as much as 5 Gm. of sodium glycocholate daily to ordinary sized dogs and have observed no untoward effects. Even in animals with obstructive jaundice, large amounts of bile salts appear to be without any deleterious effect. I know of no reason to anticipate serious consequences following bile salt administration in human beings. Dr. Broun asked about my method for determination of bile salts in the blood. Five cubic centimeters of blood is precipitated with eight volumes of alcohol and centrifugated. The supernatant fluid is evaporated to dryness and taken up in 10 cc. of alcohol. This is centrifugated and again evaporated to dryness. Sulphuric acid and furfural is added (Gregory method) and the mixture heated in a test tube at 65 degrees for thirty minutes. A definite blue color indicates the presence of bile salts. Normal blood gives no color. I have not been able to get the final solution clear enough for colorimetric comparison but have been able to match the unknown tubes with a series of standards prepared in the same way after the addition of different amounts of bile salts to normal blood. I have observed an increased flow of bile following administration of bile salts to animals with biliary fistula. Bile salts appear to be a fairly satisfactory cholagogue. However, this action is not always obtained. I would say, taking in a large number of experiments, that perhaps one or two animals out of ten will fail to give an increased flow of bile following bile salt administration. I do not know why these animals at times fail to respond to this stimulus.

A Biochemical Study of the Size of the Liver and Spleen in Disease for Differential Diagnosis

DR. MOSES BARRON, Minneapolis: This study consists of a careful statistical analysis of the weights of the liver and spleen as found in various diseases. A series of 16,000 postmortem records covering a period of ten years from the department of pathology at the University of Minnesota Medical School was reviewed, from which there were chosen 312 cases of apparently normal adults killed suddenly from accidental causes. This group furnishes the normal weight standard. Another group of 489 cases is classified, in which there was also no abnormality found other than hemorrhage. This group shows the effect of hemorrhage on the weight of these organs. The principal study consists of a group of 5,843 cases subdivided into the various diseases, and the weights of the livers and spleens are presented so as to give the percentage of each group falling into various weight zones. It is found, for example, that leukemia gives the largest percentage of very large spleens with practically no spleen falling in the lower weight zones. Toxic goiters give almost as large spleens as amyloid disease. Carcinoma, both primary and secondary, and melanoma produce the largest livers, while malignant conditions that produce cachetic states result in the smallest livers and spleens. This study on a biometric basis is found to be superior to the simple statistical analysis made of the same group of cases (The Importance of Hepatomegaly and Splenomegaly in Differential Diagnosis, *Arch. Int. Med.* **50**:240 [Aug.] 1932) and is a great aid in the differential diagnosis of many disease states.

DISCUSSION

DR. JOHN FOULGER, Cincinnati: I wonder if Dr. Barron knows of Barcroft's work on the spleen of the dog, which showed that during pregnancy the spleen was greatly shrunken. How does Dr. Barron reconcile this fact with his results showing spleens in abortion cases to be about 30 per cent above normal size?

DR. FREDERICK A. WILLIUS, Rochester, Minn.: I should like to ask Dr. Barron whether in his studies of the weight and ranges of normal livers and spleens he has considered the height and weight of the individual.

DR. MOSES BARRON, Minneapolis: The height and weight were not taken into consideration in this study. Another study is contemplated for this purpose. The present study simply shows the weights of liver and spleen for adults over 20 years of age, irrespective of their height or weight. In regard to the experiment cited relative to the size of the spleen in pregnancies, I have no data on this particular phase. Our studies were on septic spleens following abortion; therefore it was not the pregnancy that influenced the size of the spleen but the associated septicemia. An interesting fact, however, is shown in this chart in that the spleens in cases of subacute bacterial endocarditis are definitely larger than those from simple septicemia. An enlarged spleen is therefore more characteristic of subacute endocarditis.

A Possible Relationship Between Antisyphilitic Treatment and Portal Cirrhosis

DR. C. W. BALDRIDGE, Iowa City: In this study of portal cirrhosis, every effort was made to include only undoubted cases. Thirty-six such cases were found in the records of the University Hospital for the past twelve years. In sixteen of these the diagnosis was confirmed by necropsy and in two others it was confirmed at operation. Fifteen of the thirty-six patients had syphilis. Of these fifteen patients with syphilis, two had had no treatment, two may or may not have had treatment, and eleven had treatment which in most instances was intensive. Active antisyphilitic treatment with mercury and arsphenamine was begun an average of six years before the patients were found to have portal cirrhosis, and the average duration of treatment with arsphenamine was more than two years. Four of the patients in whom cirrhosis followed antisyphilitic treatment used no alcohol at all (three were women) and only three used alcohol excessively and regularly. In one patient, a minister's wife, who used no alcohol and who did not have syphilis, cirrhosis developed after antisyphilitic treatment. Circumstances that tend to incriminate the antisyphilitic treatment as the principal etiologic factor in the production of portal cirrhosis in most of the twelve cases in this series were studied.

DISCUSSION

DR. E. G. WAKEFIELD, Rochester, Minn.: I should like to ask Dr. Baldridge whether he studied the effects of repeated doses of the arsenicals or mercurials carried on over a long period of time to determine whether there were changes in the liver of a cirrhotic type.

DR. C. W. BALDRIDGE, Iowa City: Arsphenamine does produce liver damage in animals (Craven, E. B., Jr.: *Bull. Johns Hopkins Hosp.* **48**:131 [March] 1931). The question comes up as to whether or not such damage will eventually result in cirrhosis or a lesion which is often called cirrhosis. If Mallory's classification is followed, I believe that toxic cirrhosis will develop. I do not know that any of the animals have been followed long enough to develop a typical toxic cirrhosis, such as is seen in the human being.

The Urinary Excretion of Iodine in Toxic Goiter

DRS. GEORGE M. CURTIS and FRANCIS J. PHILLIPS, Columbus, Ohio: The normal urinary excretion of iodine of hospital patients in central Ohio ranges from 25 to 75 micrograms daily. It is at a normal range in patients with nontoxic nodular goiter and also in those with nontoxic diffuse colloid goiter. In patients with diffuse hyperplastic goiter with severe hyperthyroidism, it is greatly increased during the early exacerbation of untreated toxicity. It is increased during induced

hyperthyroidism and in patients with toxic nodular goiter. The urinary excretion of iodine rises immediately following thyroidectomy. The rise soon subsides. When iodine is administered quantitatively to patients with diffuse hyperplastic goiter with hyperthyroidism, the urinary excretion of iodine is low during the first few days. There ensues an increasing excretion of iodine as clinical improvement ensues. This is interpreted as due to the taking up of iodine by the depleted gland and tissues. The cyclic changes in the urinary excretion of iodine in women are accentuated in patients with toxic goiter.

DISCUSSION

DR. H. L. ALT, Chicago: Is the urinary excretion of iodine increased in other conditions in which there is a high metabolic rate, such as leukemia or fever?

DR. LOUIS LEITER, Chicago: I should like to ask whether or not in the case of hyperthyroidism following thyroid administration there was an increase of iodine in the urine. Also, what happens to the urinary excretion of iodine in a patient who has no hyperthyroidism at all but undergoes a major operation? And, from a theoretical standpoint, do the authors have any idea as to the basis of the therapeutic effects of iodine on hyperthyroidism when the blood is full of iodine and, apparently, the gland is unable to take it up from the blood?

DR. W. O. THOMPSON, Chicago: I congratulate Drs. Curtis and Phillips for making observations of fundamental importance. I notice that in normal individuals the iodine in the urine varied from 25 to 75 micrograms daily, a variation of 300 per cent. I wonder whether this variation might be accounted for largely by differences in the amounts of iodine in the food ingested.

DR. WARREN B. COOKSEY, Detroit: I wonder whether the authors have shown any correlation between the iodine content of the glands that were removed by thyroidectomy and the iodine content in urine and blood. A few years ago two of us in Detroit did some work in which we attempted biologically to assay thyroid glands that were removed at the operating table because of thyrotoxicosis. We fed these desiccated glands to tadpoles in order to ascertain what rate of metamorphosis would occur with the different specimens. We found absolutely no correlation between clinically toxic goiter and the iodine content of those glands as they were biologically assayed. In other words, the higher the iodine content according to the assay of thyroid extract, the greater stimulus to metamorphosis would be expected. That did not hold true, even in patients who had not been given compound solution of iodine. Some of the glands of very high iodine content stimulated metamorphosis much less than those of lower iodine content.

DR. JOSEPH L. MILLER, Chicago: There has been a recent report in the German literature on this problem and the results recorded are in accord with those of Drs. Curtis and Phillips. They determined not only the iodine in the urine, but the amount in the stool and the amount in the perspiration. This loss, through these various channels, may be so great immediately after a subtotal thyroidectimy that the organic iodine practically all disappears from the blood. This has raised the question of whether or not reaction that occurs after the operation may be due to a hypothyroxemia.

DR. ROGER MORRIS, Cincinnati: I should like to ask the authors whether any observation has been made on patients presenting symptoms and physical signs of thyrotoxicosis when the metabolic rate was normal or subnormal. In the last few years I have been interested in patients of this type. In the charts that were shown, all the patients had a high rate. Is the iodine secretion similar in patients with increased metabolic rate and in patients with a normal rate who present symptoms and signs of thyrotoxicosis? It would be interesting to try to discover whether or not the metabolic rate and the iodine excretion run parallel.

DR. G. M. CURTIS, Columbus, Ohio: We have investigated the iodine metabolism in one patient with goiter. More iodine is excreted in the urine than in the stool. Daily administration of 10 mg. of iodine to patients with toxic goiter may increase the stool excretion to 300 micrograms a day, whereas the urinary excretion may rise to 7 mg. a day. In two patients operated on for other causes than toxic goiter we have observed an increased postoperative urinary excretion of iodine. This increase is not so great as occurs in patients operated on for goiter. We find no direct correlation between the level of blood iodine and that of the basal metabolism in normal individuals, in patients without thyroid disease or in patients with hyperthyroidism. An explanation of this may be drawn from the investigations of Sturm and of Lunde. They have shown that there are two forms of blood iodine, one alcohol insoluble and the other alcohol soluble. The alcohol-insoluble form may be the thyroid hormone. In regard to the instance of induced hyperthyroidism, there would appear to be no essential difference between giving so much desiccated thyroid by mouth and thyroid hypersecretion. We have estimated the amount of iodine in the 10 grains (0.65 Gm.) of thyroid tablets as about 240 micrograms. The blood iodine is increased in patients with hyperthyroidism and yet amelioration of the symptoms ensues on iodinization. This raises the iodine paradox, which is best explained by the work of Lunde. During iodinization the alcohol-insoluble form decreases, whereas the alcohol--soluble portion increases. The diffuse hyperplastic goiter is iodine poor. When iodine is administered, its iodine content increases. Microscopically, the gland presents a marked increase in colloid. Dr. Thompson has pointed out the significance of the food iodine. The iodine content of the foods administered in the University Hospital is being determined. Certain of these contain more iodine than others. One microgram of iodine as desiccated thyroid accelerates tadpole metamorphosis. Iodine alone does not stimulate metamorphosis. We would point out that in lymphatic leukemia there is an elevation of the basal metabolism as in toxic goiter. There is a lymphocytosis as in toxic goiter and also a response to iodine. It was discovered by Sturm that in lymphatic leukemia there is an elevation of the blood iodine. We have confirmed this observation.

Calorigenic Effects of the Oral Administration of Thyroxine in Various Forms

DRS. W. O. THOMPSON and P. K. THOMPSON, S. B. NADLER, PH.D., DR. S. G. TAYLOR III and L. F. N. DICKIE, B.S., Chicago: Observations have been made which show that, contrary to the generally accepted opinion, thyroxine has a very definite effect on the basal metabolism when administered by mouth but that its effect varies greatly according to the form in which it is given. Compared with the effect of intravenous administration of an alkaline solution of thyroxine, the oral administration of pure thyroxine produces only about one one-hundred-and-fiftieth as much effect, while that of the monosodium salt produces about one fourth as much effect and that of an alkaline solution about two thirds as much effect. (When thyroxine is dissolved in an excess of sodium hydroxide, the disodium salt is presumably formed.) Single large doses of desiccated thyroid by mouth, suspended in distilled water, have, on the average, the same effect as doses of thyroxine in alkaline solution containing the same amount of iodine. However, when desiccated thyroid is treated with a weak solution of sodium hydroxide, its effect may be enhanced in some instances. A peptide of thyroxine prepared by tryptic digestion of desiccated thyroid has less effect when administered orally suspended in distilled water than thyroxine in alkaline solution, but when administered in a weak solution of sodium hydroxide it has an effect which at least equals that of thyroxine in the same form. From these observations it would appear that the effect of a thyroxine compound by the oral route depends on its solubility, and that solubility in turn is dependent as much on the formation of a soluble salt as on a peptide linkage. It is now possible to treat patients with myxedema almost as cheaply by the oral administration of thyroxine in suitable form as by desiccated thyroid.

DISCUSSION

DR. JOHN FOULGER, Cincinnati: I should like to ask the authors whether they considered that a change in the optical properties of these amino acids, particularly synthetic thyroxine, might occur in making a disodium salt solution. The authors perhaps remember the work of Cushny, which showed that optical activity and pharmacologic effect are closely related. It is quite possible that in treating synthetic thyroxine with

alkali one has considerably altered the internal properties of the compound, as would be shown by the measurement of the optical rotatory power of the initial and final product.

DR. W. O. THOMPSON, Chicago: The thyroxine that we used was said by the manufacturers to be racemic, by which they meant that half of it was *d*-thyroxine and half *l*-thyroxine. The thyroxine in the peptide was probably *l*-thyroxine. There are three different groups of observations which have a bearing on Dr. Foulger's question: 1. Møller, Gram and Schou, and Thompson and his co-workers have found synthetic thyroxine and thyroxine as isolated from the thyroid gland by the method of Kendall (Squibb's thyroxine) to have about the same calorigenic action when injected intravenously in an alkaline solution, and the first observers have found the two to be the same spectrophotometrically. 2. Gaddum, on the basis of experiments on four normal rats, concluded that *l*-thyroxine produced two and one-half times as much increase in oxygen consumption as *d*-thyroxine. 3. Salter, Lerman and Means noted that a polypeptide of thyroxine isolated from the thyroid by proteolytic digestion, and presumably containing thyroxine in the levorotatory form, produced about the same increase in basal metabolism in man when injected intravenously as we had observed following the intravenous injection of Squibb's thyroxine in an alkaline solution.

Ammonia Excretion and Neutrality Regulation

DR. A. P. BRIGGS, St. Louis: It has been observed with dogs following subcutaneous administration of potassium chloride, the salt of a low threshold base and a threshold acid, that there is a greater increase in the urinary excretion of fixed base than of mineral acid. With this presumptive acid excess in the tissues there is a decreased excretion of ammonia. From disodic sulphate, the salt of a threshold base and a no threshold acid, opposite results were obtained; i. e., a greater increase in excretion of mineral acid than of fixed base and an increased excretion of ammonia with presumptive sodium residue in the tissues. These results seem incompatible with the prevalent belief that the stimulus which excites ammonia formation is increased acidity of the tissues. They are in harmony with the view that ammonia formation is stimulated by increased local acidity in the kidney tubules.

The Ultimate Fate of Damaged Glomeruli

DRS. ALAN R. MORITZ and J. M. HAYMAN, JR., Cleveland: Human kidneys obtained at autopsy were injected with iron salts and an estimate of the total number of patent glomeruli was made by Kunkel's method. The sections for histologic examination were prepared from different portions of each injected kidney, and the proportion of injected and obliterated glomeruli was determined. From these two measurements the total number of glomeruli, including intact glomeruli and glomerular scars, was estimated and compared with the number of glomeruli in normal kidneys. It was found that in arteriolar nephrosclerosis and in chronic diffuse glomerular nephritis there has been a complete disappearance of as many as 50 per cent of the glomeruli.

DISCUSSION

DR. R. W. SCOTT, Cleveland: I should like to ask whether the authors have found any correlation between the number of fibrosed glomeruli and the clinical picture of uremia. Is the number of glomeruli different in individuals dying of uremia from inflammatory nephritis as compared to those dying in uremia from nephrosclerosis?

DR. LOUIS LEITER, Chicago: I should like to ask whether there was any correlation between renal function during life and the number of vanished glomeruli in those cases in which the sum of patent and obliterated glomeruli was significantly less than the average normal number of glomeruli.

DR. J. M. HAYMAN, JR., Cleveland: I think I can answer the first two questions. In chronic vascular disease and chronic nephritis there is a rough parallelism between reduction in the urea and creatinine tests of kidney function and the number of glomeruli. In these two diseases the patients usually do not go into uremia until the glomeruli have been reduced to 25 or 33 per cent of the normal number. There is another type of uremia, that of prostatic obstruction or accompanying infection, in which the patient will have an approximately normal number of glomeruli, which under the microscope appear normal. In reply to Dr. Scott's question about young persons with so-called malignant nephrosclerosis who quite suddenly go into uremia, in this condition we did not find anything like as marked reduction in the number of glomeruli as in the chronic cases. But our estimations do not give us any measure of the amount of filter surface in the remaining glomeruli. In answer to Dr. Leiter, any glomerulus that is injected at all must be counted as a glomerulus even though the filtering surface may be reduced.

A Case of Simmond's Disease (Cachexia Hypophyseopriva) with Recovery

DR. CECIL STRIKER, Cincinnati: A white girl, aged 17 years, whose weight on admission was 48 pounds (22 Kg.) presented a basal metabolic rate of —48, flat dextrose tolerance, and slight secondary anemia. A roentgenogram of the sella showed suggestive cystic degeneration. Roentgenograms of other bones showed marked calcium deficiency. The patient had been on a regimen of thyroid and ovarian extract prior to the examination, without any improvement. She had very marked abdominal cramps with constipation and had a well marked cathartic addiction, taking as many as fifteen Feen-a-Mint tablets and three enemas daily without bloody diarrhea. She was placed on 1 cc. of soluble extract from the anterior lobe of the pituitary hypodermically, daily, and continued on this for four months, with very striking improvement. Examination shows that the patient now weighs 135 pounds (61 Kg.), has been completely rehabilitated and is apparently cured of the intestinal condition.

DISCUSSION

DR. JOSEPH L. MILLER, Chicago: I should like to ask the dosage of anterior pituitary. What did the roentgen examination of the colon show?

DR. W. O. THOMPSON, Chicago: I am interested in knowing whether this girl had starved herself before she was seen. I remember very well a girl who was similar to this patient. She was a schoolgirl of 17, who weighed 120 pounds (54 Kg.). She had a sensitive nature and, because of the constant teasing of her companions in school about her plumpness, began to diet. She gradually ate less and less until finally her appetite disappeared and her weight dropped to 65 pounds (29.5 Kg.). Menstruation ceased, and her metabolism dropped to minus 45 per cent. She was virtually skin and bones like the patient presented by Dr. Striker. When she voluntarily increased her intake of food, her weight promptly rose to 100 pounds (45 Kg.). In view of the fact that the improvement in Dr. Striker's patient persisted for six months after the administration of anterior pituitary was stopped, it would be particularly important to know just what the caloric intake was.

DR. C. C. STURGIS, Ann Arbor, Mich.: I saw two cases, which were reported from the University of Michigan. Neither case was treated with anterior pituitary. One case was reported in retrospect from the autopsy. The other patient was uncooperative and it was not possible to keep him under observation. This case was mistaken for myxedema and treated with thyroid extract without improvement and the patient then disappeared.

DR. CECIL STRIKER, Cincinnati: In answer to Dr. Miller, the course of treatment consisted of daily injections of anterior pituitary for two months, then every other day for a month, then once a week. She had a four months series of anterior pituitary and then none for six months. Unfortunately I cannot give the results of examination of the colon. She has moved away from the city but reports state that she is no longer addicted to cathartics. Regarding Dr. Thompson's inquiry, I was interested in the same question. The patient had previously been on insulin and there was no increase in appetite following the insulin. There was no psychologic factor to be removed except the use of cathartics. Her environment has been practically the same during the entire course. She was put on a high vitamin B diet. The only factor in the course of treatment was the addition of anterior pituitary.

(To be continued)

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

3: 89-124 (Sept.) 1933

Prophylaxis and Treatment of Infectious Diarrhea. A. A. Walker, Birmingham.—p. 89.
Incidence of Mental and Nervous Manifestations in Internal Medicine: Review of Three Hundred Cases. H. M. Simpson, Florence.—p. 94.
Congenital Hypertrophic Pyloric Stenosis. S. L. Ledbetter, Jr., Birmingham.—p. 97.
Treatment of Habit Spasms by Psychotherapy. C. H. Rice, Montgomery.—p. 100.
Lingual Thyroids: Report of Case. R. C. Hill, York.—p. 103.
Malaria as a Complication. C. M. Franklin, Union Springs.—p. 105.

American Journal of Cancer, New York

19: 1-258 (Sept.) 1933

*New Transplantable Tumor of the Rat: Its Transplantability and Structure. D. P. Seecof, Cleveland.—p. 1.
Extragenital Chorionepithelioma In the Male. H. G. Heaney, Chicago.—p. 22.
Multiple Hemangiomas Showing Certain Malignant Characteristics in an Infant: Report of Case. A. C. Taylor and Elizabeth Moore, St. Louis.—p. 31.
*The Abderhalden Reaction in the Diagnosis of Malignant Tumors. M. Sanchez, Boston.—p. 40.
Keratinizing Embryonal Nephroma of the Kidneys of the Chicken. W. H. Feldman and C. Olson, Jr., Rochester, Minn.—p. 47.
Diagnosis and Treatment of Lesions of the Breast. S. W. Harrington, Rochester, Minn.—p. 56.
Bone Tumors: General Practice Problem. M. C. Mensor, San Francisco.—p. 65.
The Inheritance of Cancer in Mankind. A. Hunter.—p. 79.
Real and False Progress in Cancer Research. E. B. Krumbhaar, Philadelphia.—p. 83.

Transplantable Tumor of the Rat.—Seecof describes a tumor that he has had under investigation since June, 1928. It appeared on the supra-orbital region of a rat and has been transplanted through nineteen generations, taking in about 30 per cent of the transplants. It grows best in the peritoneal cavity. In structure it resembles a carcinoma, but the type cell suggests that the tumor may belong to the endothelioma or myeloma group. Since the tumor was undifferentiated, the primary object has been to transplant it through as many generations as possible, in the hope that its structure might become more differentiated and identifiable from the standpoint of common nomenclature. To date the structure has remained unaltered and the exact nature is still unknown. While the transplantations were carried out, observations and experiments were made on the influence of heredity, multiplicity of inoculations and cytologic variations in relation to takes. The author records the data on transmissibility and structure.

Abderhalden Reaction in Malignant Tumors.—Sanchez made 228 Abderhalden tests with nine different types of substratums; 123 were positive, 62 negative, 20 uncertain and 23 without result. Counting all tests, even those with technical errors, the diagnostic accuracy is 72.3 per cent. Of the 131 tests made with serums from patients having malignant tumors, 107 were positive, 4 negative, 11 uncertain and 9 without result. Of the 97 tests made with serums from patients having other diseases or from normal persons, 16 were positive, 58 negative, 9 uncertain and 14 without result. Of 36 tests made with substratum E, 18 were made with serums from malignant cases, of which 13 were positive, 3 uncertain and 2 gave no result, and the other 18 were made with serums from nonmalignant cases, 3 of which were positive, 10 negative and 5 gave no result. Without counting the uncertain reactions and those giving no results, the percentage of errors is 11.5. Of 152 tests made with substratum D (mixture of carcinoma and sarcoma), 88 were positive, 39 negative, 14 uncertain and 11 gave no result. Of 99 tests made with serums from malignant cases, 78 were positive, 1 negative, 6 uncertain and 6 gave no result. Of 61 tests made with serums from other patients and from normal persons, 10 were positive, 38 negative, 8 uncertain and 5 gave no result. One substratum D serum from a malignant case gave a negative result and 10 serums from other patients and normal persons gave positive results. In these 11 cases the test failed. Among the nonmalignant cases which gave positive results were 5 in which the clinical diagnoses were typhoid, epidemic (lethargic) encephalitis, respiratory infection, mastoiditis and pneumonia. In 5 cases a positive reaction was obtained at a time when the clinical diagnosis of the malignant condition was indefinite or negative. Later either the pathologic report or the surgical report proved the result of the blood test.

American Journal of Clinical Pathology, Baltimore

3: 327-404 (Sept.) 1933

The Clinical Pathologist as Consultant and Teacher. W. M. Simpson, Dayton, Ohio.—p. 327.
Agglutinin Content of Blood Following Typhoid and Paratyphoid Immunization. A. G. Foord and Anna Forsyth, Pasadena, Calif.—p. 333.
Cholecystectomy as Seen by Surgical Pathologist: Report of Two Hundred and Twenty-Three Cases. C. W. Maynard, Pueblo, Colo.—p. 339.
Classification and Pathogenicity of Certain Monilias. W. D. Stovall and S. B. Pessin, Madison, Wis.—p. 347.
*Moniliasis of Lungs and Stomach: Case Report with Autopsy. S. J. Lewis, Beaumont, Texas.—p. 367.
*New Method of Reticulocyte Enumeration. E. M. Schleicher, Detroit.—p. 375.
Culture Medium for Rapid Growth of Pasteurella Tularensis. L. Foshay, Cincinnati.—p. 379.
Three Notes on Biologic Stains. A. T. Brice, Jr., Palo Alto, Calif.—p. 381.

Moniliasis of Lungs and Stomach.—Lewis describes a fatal case of pulmonary and gastric (pyloric) moniliasis accompanying a pernicious-like anemia. The patient presented a clinical picture similar to that of advanced pulmonary tuberculosis. The copious sputum contained Monilia albicans, type II (Stovall), in large numbers. The monilia isolated was rather pathogenic for guinea-pigs, even after more than two years of artificial cultivation. Iodides by mouth did not stop the progress of the disease, perhaps owing to the late extensive involvement when treatment was begun. More frequent study of sputums is indicated for the purpose of detecting monilia and other fungus infections of the lungs. Monilia in sputum is a rather frequent finding and is perhaps more often a nonpathogenic secondary invader. The finding of monilia should not prevent a further search for other causes of pulmonary pathologic changes.

Reticulocyte Enumeration.—Schleicher proposes a new method of reticulocyte enumeration. He places twenty-five parts of solution A (1 Gm. of neutral potassium oxalate, 0.85 Gm. of sodium chloride and 100 cc. of distilled water) to five parts of solution B (1 Gm. of brilliant cresyl blue, 0.85 Gm. of sodium chloride, 100 cc. of distilled water and 1 Gm. of chlorbutanol) in a conical tipped centrifuge tube to mix them and adds several drops of blood. After thorough mixing, he allows the solution to stand from ten to twenty minutes, and then centrifugates it from twenty to thirty seconds at a moderate speed. The supernatant fluid is pipetted off until a layer of fluid approximately equal to the depth of the sediment remains. The sediment is mixed well with the supernatant liquid, drawn up in the pipet, and one drop is discharged near the end of a slide. The stained drop is spread with the edge of an 18 mm. square coverslip, and the film is drawn to about 6 cm. from the starting point. The relative distribution of the reticulocytes is found by dividing a piece of paper into ten columns, adjusting a 4 × eyepiece to a tube length of 190 mm. and using an oil immersion objective 1.8 mm. by 95, numeric aperture 1.3, in order to obtain the specific microscopic working field. The relative distribution of the reticulocytes will usually show about four variations in concentrations: extremely high, high, low and extremely low or absent. The objective is placed on the upper edge of the film near the starting point, the slide is moved upward in a vertical line and several fields are counted that show the highest as well as the moderately high, moderately

low and low reticulocyte concentrations. The counts of each classification are recorded in column one. When the lower edge of the film is reached, the slide is moved to the left horizontally 0.5 cm., from this point the slide is moved downward and the reticulocyte concentrations are counted and recorded in column two. Ten vertical zones are counted in this manner. If a vertical zone does not show any reticulocyte, a zero is marked in the corresponding column. There will be found approximately 150 microscopic fields in a vertical zone, and the average field shows about forty erythrocytes. When the ten reticulocyte counts have been added, the total number is referred to as the sum of reticulocytes. In the same ten fields there are 400 erythrocytes. The ratio of reticulocytes to erythrocytes is therefore the sum of reticulocytes over 400. The percentage of reticulocytes is the sum of reticulocytes over 400×100, or the percentage equals the sum of the reticulocytes $\times 0.25$.

American Journal of Hygiene, Baltimore

18: 247-490 (Sept.) 1933

Detection of Proteins of the Nematode Hemonchus Contortus in the Serums of Infected Sheep and Goats. J. E. Stumberg, Princeton, N. J.—p. 247.

Resistance to Infestation with Trichinella Spiralis in Hogs: Eosinophilic and Precipitin Response. G. W. Bachman and R. R. Molina, San Juan, P. R.—p. 266.

Host Fatigue and Feeding in Their Relation to Reproductive Activity of Plasmodium Cathemerium Hartman. G. H. Boyd, Augusta, Ga.—p. 295.

Yellow Fever Virus Encephalitis in Rodents. W. Lloyd, H. A. Penna, Bahia, Brazil, South America, and A. F. Mahaffy, Lagos, Nigeria, Africa.—p. 323.

Diversity of Types Found in Stock Cultures of Streptococcus Epidemicus. P. R. Edwards, Lexington, Ky.—p. 345.

Comparison of Certain Properties of Neurotropic Virus of Yellow Fever with Those of Corresponding Viscerotropic Virus. M. Frobisher, Jr., Bahia, Brazil, South America.—p. 354.

Relation Between Vitamin A Metabolism and Susceptibility to Diphtheria Toxin. C. C. Torrance, Albany, N. Y.—p. 375.

Serologic Diagnosis of Typhoid Carriers. J. Wyllie, Kingston, Ont.—p. 393.

Effect of Emetine on Endamoeba Histolytica in Culture. J. H. St. John, Manila, P. I.—p. 414.

New Variety of Retortamonas (Embadomonas) Intestinalis from Man. M. J. Hogue, Philadelphia.—p. 433.

Antigenic Properties of Bacteriophage Lysates of Salmonella Suipestifer: V. Protection Tests with Rabbits: General Résumé. Pearl Kendrick, Baltimore and Grand Rapids, Mich.—p. 442.

Epizootic Fox Encephalitis: IV. Intranuclear Inclusions. R. G. Green, M. S. Katter, Minneapolis; J. E. Shillinger and K. B. Hanson, Washington, D. C.—p. 462.

Studies on Benign Tertian Malaria: III. Absence of a Heterologous Tolerance to Plasmodium Vivax. M. F. Boyd, Tallahassee, Fla., and W. K. Stratman-Thomas, Jacksonville, Fla.—p. 482.

Id.: IV. Refractoriness of Negroes to Inoculation with Plasmodium Vivax. M. F. Boyd, Tallahassee, Fla., and W. K. Stratman-Thomas, Jacksonville, Fla.—p. 485.

American Journal of Ophthalmology, St. Louis

16: 669-758 (Aug.) 1933

Continuous Circulation of Aqueous Humor. M. U. Troncoso, New York.—p. 669.

Argyll Robertson Phenomenon in Multiple Sclerosis. J. L. Abramson and M. H. Teitelbaum, Brooklyn.—p. 676.

Simulation and Ocular Hysteria. C. Charlin, Santiago, Chile, South America; translated by H. Coghlan.—p. 683.

Brilliance of an Object Seen Binocularly. G. A. Fry and S. H. Bartley, St. Louis.—p. 687.

Recurrent Vitreous Hemorrhage. J. M. Levitt, Brooklyn.—p. 693.

Entoptic Phenomena Observed in My Eyes Before and After Cataract Operations. Coral Clark, Wuchang, China.—p. 706.

Metastatic Carcinoma of the Choroid: Report of Case. P. DeLong, Philadelphia.—p. 712.

Medical Economics. W. F. Hoffman, Seattle.—p. 716.

*Exophthalmos in Leukemia. A. B. Reese and L. Guy, New York.—p. 718.

Cholesterin Crystals in the Anterior Chamber. J. Fejer, Budapest, Hungary; translated by W. H. Crisp.—p. 721.

Exophthalmos in Leukemia.—Reese and Guy report a case of lymphatic leukemia in which the ocular manifestations first led the patient to seek medical advice. The first manifestation in the sequence of events was a choroidal hemorrhage, with detachment of the retina in the left eye. Six days later an orbital hemorrhage with exophthalmos and a choroidal hemorrhage with detachment of the retina occurred on the right side. Five days later this was followed by an enormous expulsive hemorrhage in the orbit on the left side. This was of an extreme degree, the eyeball protruding beyond the palpebral aperture and literally lying on the cheek. The bulbar conjunctiva was pushed out and exuded sanguineous serum. Because of the exposure of the eye and the resulting discomfort, an enucleation was done. At the time of the operation the orbit was found to be completely filled with blood and a microscopic examination of the globe showed the retinal detachment to be due to choroidal hemorrhage. The patient died on the fifteenth day.

American Review of Tuberculosis, New York

28: 165-292 (Aug.) 1933

Bilateral Phrenic Exeresis in Pulmonary Tuberculosis: Report of Case. H. Schwatt, Spivak, Colo.—p. 165.

Evaluation of Scaleniotomy Accompanying Phrenic Evulsion. A. L. Brown and Kathleen J. Atkinson, San Francisco.—p. 176.

Simplified Artificial Pneumothorax Apparatus. W. M. Stockwell, Hartford, Conn.—p. 183.

Valveless Artificial Pneumothorax Syringe. E. H. Lee, Tuskegee, Ala.—p. 185.

Air Embolus: Case Reports. M. Pollak, Peoria, Ill.—p. 187.

*Prevention of Air Emboli in Artificial Pneumothorax: Simple Protective Technic. B. W. Cobbs, Montgomery, Ala.—p. 196.

Acute Pulmonary Atelectasis Following Hemoptysis: Report of Case. J. Rosenblatt, Liberty, N. Y.—p. 198.

Vitamin Therapy in Pulmonary Tuberculosis: III. Effect of Viosterol on Absorption, Retention and Excretion of Calcium. P. D. Crimm, J. W. Strayer, H. L. Watson and G. Heimann, Evansville, Ind.—p. 202.

Psychology of Tuberculosis. C. B. Ross, Gravenhurst, Ont., Canada, and W. S. Stanbury, Hamilton, Ont., Canada.—p. 217.

Tuberculophobia. M. J. Breuer, Lincoln, Neb.—p. 229.

Tuberculous Pneumothorax in Infancy. J. Greengard and I. R. Abrams, Chicago.—p. 236.

Study of Childhood Tuberculosis in Detroit: Preliminary Report. J. A. Johnston and H. D. Chadwick, Detroit.—p. 244.

Tuberculosis in Children: Case Finding Methods and Results in Cattaraugus County, New York. J. H. Korns, Olean, N. Y.—p. 251.

Tuberculosis in Girls and Young Women. L. Arnold, Chicago.—p. 262.

*Cockroach as Possible Carrier of Tuberculosis. H. C. Read, Jr., Fort Smith, Ark.—p. 267.

Tuberculosis of Human Origin in an Amazon Parrot. W. R. Hinshaw, Davis, Calif.—p. 273.

*Technic for Estimating the Number of Tubercle Bacilli in Sputum. J. Hughes, Philadelphia.—p. 279.

Use of Paper Films in Study of Tuberculous Enteritis. C. J. Zintheo, Jr., Richmond Highlands, Wash.—p. 289.

Air Emboli and Artificial Pneumothorax.—Cobbs, in his procedure for the prevention of air embolus developing during pneumothorax, uses the Robinson type of machine and has the water level in the air bottle some 8 or 10 cm. higher than that in the pressure bottle. The procedure used is the reverse of that in giving a refill and the operating needle is fitted to the terminal connection. The stopcocks to the manometer and that controlling the flow of water between the bottles are opened. This starts the flow of water from the air bottle into the pressure bottle, with the consequent aspiration of air through the needle. With this condition established, the needle is pushed through the skin. The stopcock governing the flow of water between the two bottles is closed and the needle is carefully pushed deeper into the tissues. The parietal pleura is thus penetrated with a standing negative pressure in the needle of minus four or five. With the needle in a free space, the petcock between the two bottles is opened and during an initial compression there is, as a rule, sufficient negative pressure to draw the water from the pressure bottle into the air bottle, even with the water standing some 6 or 8 cm. higher in the air bottle. The author states that by using this technic there is no chance for an embolus even if the needle is in the lung or in a venule and that this modification is also of value when free full oscillation is not obtained, as there is no danger in opening the supply petcock while the point of the needle is adjusted or changed, seeking a full oscillation.

Cockroach as Possible Carrier of Tuberculosis.—The experiments of Read show that the cockroach may be considered a possible mechanical carrier of tuberculosis, as (1) all smears of the intestinal tracts were positive, thus showing that the cockroach will eat positive tuberculous sputum, (2) these organisms when recovered from the intestinal tracts are viable, for they produced typical lesions in the guinea-pig, and (3) microscopic sections did not show the bacilli to be present in the tissues, thus showing that they remain in the intestinal tract. If tuberculosis patients and "carriers" do not properly dispose of their sputum, rags, handkerchiefs or paper expectorated into, the cockroaches may make a meal of this material and crawl away to the kitchen or pantry and thus contaminate the food. Kitchens and pantries of the neighbors may also be contami-

nated, because cockroaches have been known to migrate in a body from one house to another.

Estimating Tubercle Bacilli in Sputum.—Hughes devised a method for making a closely approximate estimate of the number of tubercle bacilli in a specimen of sputum, by obtaining a homogeneous distribution of bacilli throughout the specimen and counting the bacilli in a measured quantity (1 c.mm.) of the specimen. In preparing the specimen and smear, 1 cc. of a 10 per cent solution of sodium hydroxide is pipetted into a 10 cc. test tube and 2 cc. of sputum is added, along with three glass beads. The mouth of the test tube is flamed and stoppered with a cork. The tube is placed in a shaking machine in a horizontal position and agitated. Because of the viscosity of the sputum the author has used pieces of ordinary glass tubing, 4 mm. in diameter and 25 cm. in length and graduated by a mark with a file to deliver 2 cc., instead of the usual type of pipet. Sputum can be readily drawn up into such a pipet by means of a Luer syringe attached to it by rubber tubing. After being digested and shaken for thirty minutes, the specimen is removed from the shaking machine and an area of 400 sq. mm. is marked off on the end of a 1 inch microscopic slide. This measurement introduces an error of less than 0.5 per cent. The slide is cleansed by being placed over night in a solution of 97 cc. of alcohol and 3 cc. of acetic acid. By means of a standard loop, one loopful of serum used to fix the bacilli to the slide and one loopful of the digested sputum are mixed together on the slide and are then spread in a uniform smear over the marked off area. The smear is dried in air, fixed by heat and stained by the usual Ziehl-Neelsen technic. Ten scattered oil immersion fields are examined and the average number of bacilli per field is estimated. This average is then corrected for the dilution of the sputum by sodium hydroxide by multiplying the number of bacilli seen per field by the factor 1.5.

Annals of Medical History, New York

5: 409-510 (Sept.) 1933

The Two Heberdens: William Heberden the Elder (1710-1801): William Heberden the Younger (1767-1845). H. Rolleston, Haslemere, Surrey, England.—p. 409.
Henry Ingersoll Bowditch. A. A. Walkling, Philadelphia.—p. 428.
An Account of Dr. Theodore Turquet de Mayerne's "Praxis Medica" Augsburg, 1691. T. Gibson, Kingston, Ont., Canada.—p. 438.
The "De Ovorum Gallinaceorum Generationis Primo Exordio Progressuque, et Pulli Gallinacei Creationis Ordine" of Volcher Coiter. Translated and edited with notes and introduction by H. B. Adelmann, Ithaca, N. Y.—p. 444.
Willard Parker. J. Ruhräh, Baltimore.—p. 458.
Introduction to History of Women in Medicine: II. Medical Women of the Middle Ages. Kate Campbell Hurd-Mead, Haddam, Conn.—p. 484.

Archives of Dermatology and Syphilology, Chicago

28: 309-460 (Sept.) 1933

Brief Review of Fever Therapy in Neurosyphilis. H. Beckman, Milwaukee.—p. 309.
Bismuth Compounds in Treatment of Active Syphilis: Clinical and Laboratory Study of Two Hundred and Eighty-Six Cases of Cutaneous Syphilis. S. Irgang, E. R. Alexander and A. M. Sala, New York.—p. 320.
Diagnostic Value of the Organic Luetin Reaction. J. V. Ambler, Denver.—p. 353.
Amebiasis Cutis: Report of Case. S. Crawford, Pittsburgh.—p. 363.
*Unusual Dermatosis Following Section of the Fifth Cranial Nerve. A. B. Loveman, Ann Arbor, Mich.—p. 369.
Extragenital Infection with Virus of Lymphogranuloma Inguinale. W. Curth, New York.—p. 376.
*Anterior Lobe Pituitary Extract in Treatment of Alopecia. L. W. Lord, Baltimore.—p. 381.
Purpura Annularis Telangiectodes: Report of Case with Autopsy. O. L. Levin and J. A. Tolmach, New York.—p. 384.
*Therapeutic Efficiency of Bismarsen in Experimental Syphilis in Rabbits: Comparison with Arsphenamine. G. W. Raiziss and Marie Severac, Philadelphia.—p. 389.

Dermatosis After Section of Fifth Cranial Nerve.—Loveman presents the history of a woman who nine months after a radical resection of the sensory root of the gasserian ganglion had two superficial 18 mm. ulcers above the hair line in the posterior frontal area, covered with a purulent necrotic slough. Trophic ulcerations, trophic ulcers with a superimposed carcinomatous degeneration and a possible factitious dermatitis were the three clinical diagnostic possibilities. The fact that the lesions were so sharply limited to the anesthetic area, were unilateral and followed roughly the nerve distribution makes a diagnosis of factitious dermatitis untenable. Furthermore, the fact that the condition responded to roentgen therapy and failed to recur adds to the improbability of such a diagnosis. Carcinoma was ruled out only after careful histologic studies. Large doses of roentgen rays were given because of the original opinion that the changes were epitheliomatous. In view of the previous damage to the nerve, the superficial nature of the lesions and their zosteriform distribution, the author believes that atrophic disturbance best explains their occurrence. Just why the lesions responded so rapidly to roentgen therapy, he does not know.

Pituitary Extract in Treatment of Alopecia.—Lord states that in a series of seventeen cases of alopecia treated with pituitary extract he has observed no evidence for or against the extract. He is sure that the study of a large series of cases of alopecia areata would reveal the fact that the average length of time required for the regrowth of hair varies between six months and a year. In the three patients whom he treated with the pituitary extract at the time of the appearance of Bengtson's article he found no evidence which might lead him to believe that the drug was of any value, and in three other patients who have since submitted to its administration the results have been such as to give him no cause for altering his view.

Bismuth Arsphenamine Sulphonate in Rabbit Syphilis.—The experiments of Raiziss and Severac revealed that the maximal tolerated dose of bismuth arsphenamine sulphonate given intramuscularly to albino rats is from 450 to 500 mg. per kilogram of body weight. This is an evidence of low toxicity. Fourteen syphilitic rabbits were cured by a single dose of bismuth arsphenamine sulphonate, as judged by the method of popliteal node transfer. The minimal therapeutic dose was found to be from 10 to 15 mg. per kilogram. When treated by ten weekly or twenty semiweekly injections of 3 mg. of bismuth arsphenamine sulphonate per kilogram, four animals were cured and three were not. Sixteen animals treated with higher doses were all cured. The minimal therapeutic dose for a series of twenty injections was found to be 4 mg. per kilogram. The minimal therapeutic dose for a series of from ten to twenty injections was 5 mg. per kilogram, and for a series of ten injections, 10 mg. The minimal effective single dose of arsphenamine for a syphilitic rabbit, when given intravenously, was found to be from 16 to 18 mg. per kilogram. The minimal effective single dose of arsphenamine administered intramuscularly was 20 mg. per kilogram. It appears, therefore, that bismuth arsphenamine sulphonate is as effective as arsphenamine in experimental syphilis in rabbits.

Archives of Ophthalmology, Chicago

10: 293-432 (Sept.) 1933

Operative Treatment of Detachment of the Retina: Abstract of the Official Review Presented Before the International Ophthalmologic Congress, Madrid, Spain, April 18, 1933. A. Vogt, Zurich, Switzerland.—p. 293.
Operative Treatment of Chronic Glaucoma: Report of Two Hundred Successive Operations. A. Knapp, New York.—p. 298.
Ocular Syphilis: IV. Interstitial Keratitis and Trauma; Clinical, Experimental and Medicolegal Aspects. J. V. Klauder, Philadelphia.—p. 302.
Employment of a Conjunctival Bridge and Suture in Cataract Extraction. G. Slocum, Ann Arbor, Mich.—p. 329.
Ocular Lipid Histiocytosis and Allied Storage Phenomena. P. Heath, Detroit.—p. 342.
*Herpes Corneae Occurring After Artificial Hyperpyrexia Induced by Diathermy. M. L. Berliner, New York.—p. 365.
Relation of Ocular Sensitivity to Arthus Phenomenon in the Rabbit. E. L. Burky, Baltimore.—p. 368.
Trachoma: Treatment with Chaulmoogra Oil. E. D. Kuznetskaya, Perm, U. S. S. R.—p. 375.

Herpes Corneae After Hyperpyrexia.—Berliner reports two cases of chronic arthritis complicated by an ocular disturbance after artificial hyperpyrexia induced by diathermy. Physical therapeutists report that herpes labialis is not an uncommon sequela and generally appears within twenty-four hours after treatment is instituted. In the cases reported the previous ocular and otolaryngologic histories were without significance. Any attempt made to explain the manifestation of herpes in these patients would naturally be speculative. Perhaps some persons harbor the virus of herpes in an inactive form in the body, and it may be that only a favorable stimulus such as fever is required to initiate an outbreak.

Journal of Pediatrics, St. Louis

3: 1-264 (July) 1933

Erythroblastosis in Icterus Gravis Neonatorum. A. F. Abt, Chicago.—p. 7.
Disappearing Time of Dyes Injected Intradermally. S. Amberg, Rochester, Minn., and R. Nutting, Duluth, Minn.—p. 31.
Body Build in Infants with Acute Intestinal Intoxication. H. Bakwin and Ruth Morris Bakwin, New York.—p. 36.
Acrodynia: Note on Pathologic Physiology. K. D. Blackfan and C. F. McKhann, Boston.—p. 45.
Rôle of Erythrocyte Fragmentation in Genesis of Anemia. T. B. Cooley and Pearl Lee, Detroit.—p. 55.
Pediatrics: What Is It? W. C. Davison, Durham, N. C.—p. 64.
Serum Proteins and Lipoids in Eczema of Infants and Children. H. K. Faber and Dorothy B. Roberts, San Francisco.—p. 78.
Intracellular Fluid Loss in Diarrheal Disease. A. M. Butler, C. F. McKhann and J. L. Gamble, with assistance of Pauline Marsh, Boston.—p. 84.
*Observations on Effect of Aging on Potency of Spray-Dried Antiscorbutic Material. H. J. Gerstenberger, Donalda N. Smith and G. L. Hacker, Cleveland.—p. 93.
Diphtheria Immunization with Concentrated Toxoid Intradermally. A. Goldbloom and D. L. Klein, Montreal, Canada.—p. 112.
Myelophthisis. H. M. Greenwald, Brooklyn.—p. 117.
Fetal and Neonatal Mortality. C. G. Grulee, Chicago.—p. 132.
Renal Changes in the Rabbit Resulting from Intravenous Injection of Hypertonic Solution of Sucrose. H. F. Helmholz, Rochester, Minn.—p. 144.
*Familial Retardation in Ossification of the Carpal Centers. A. F. Hess and H. Abramson, New York.—p. 158.
Alimentary Toxicosis. S. Karelitz, New York.—p. 166.
Measles in New-Born Infants (Maternal Infection). J. L. Kohn, New York.—p. 176.
Observations on Nature and Treatment of Diarrhea and Associated Systemic Disturbances. W. M. Marriott, A. F. Hartmann and M. J. E. Senn, St. Louis.—p. 181.
Note on Pathogenesis of Renal Rickets: Derangements of Calcium and Phosphorus Metabolism in Nephritis. A. G. Mitchell and G. M. Guest, Cincinnati.—p. 192.
Alleged Correlation Between the Rate of Growth of the Suckling and the Composition of the Milk of the Species. G. F. Powers, New Haven, Conn.—p. 201.
Treatment of Poliomyelitis: Past and Present. J. Ruhräh, Baltimore.—p. 217.
*Influence of Fruit and Vegetable Feeding on Iron Metabolism of the Infant. F. W. Schultz, Minerva Morse and Helen Oldham, Chicago.—p. 225.
Cholesterol Partitions of the Blood in Myxedema (Cretinism). H. Schwarz and Anne Topper, New York.—p. 242.
Interpretation of Basal Metabolism of Children. F. B. Talbot, Boston.—p. 247.
Motion of Growth: XV. Prolegomena to Clinical Study of Human Growth and Metabolism. N. C. Wetzel, Cleveland.—p. 252.

Effect of Aging on Antiscorbutic Material.—Gerstenberger and his associates found that fresh orange juice, spray dried as a constituent of a lactose orange juice mixture, retains its antiscorbutic potency in a practically undiminished degree for at least fifteen months after its manufacture. This conclusion was reached on the basis of observations made on groups of scorbutic guinea-pigs and in one severe case of infantile scurvy. The scorbutic guinea-pigs were cured by the daily administration of an amount of the spray-dried orange juice equivalent to 3 cc. of fresh orange juice, and the human infant by the giving of a daily dose equal to 45 cc. of fresh orange juice. Fresh lemon juice, spray dried as a constituent of an acid protein milk to which is added at the time of manufacture 20 cc. of lemon juice per liter, possessed, from five to twenty-three months after its manufacture, antiscorbutic potency adequate to cure scurvy in six scorbutic infants, as judged clinically and roentgenologically. The weight curves in the two infants who were decidedly underweight responded with an immediate, decided and continuous upturn, whereas the weight curves of the four infants who were not so much underweight did not so respond even though the clinical and roentgenologic symptoms of scurvy had disappeared. In two of these four infants, additional administration of the antiscorbutic vitamin in the form of fresh orange juice did not alter the weight curve at the time. Infections that were present in these infants on a nonscorbutic basis were accepted as the principal cause for the irregular weight curves. These six infants received daily at different periods the equivalent of from 9 to 24 cc. of lemon juice in the form of acid protein milk. No case of scurvy in infants fed the acid protein milk has so far come to the authors' attention. This observation indicates that this milk is adequately antiscorbutic.

Retardation in Ossification of Carpal Centers.—Hess and Abramson report an instance of prolonged retardation in the development of the carpal centers in two brothers. In the older brother, as late as 8 years of age, but two centers had appeared at the wrist and no progress had been made in this respect for two years. Suddenly during the ninth year, from winter to autumn, a spurt in ossification came about. Films taken in November of this year revealed the presence of five centers in the left and six in the right wrist, in addition to new centers at the distal ends of the ulnas, the appearance of which had been delayed by approximately two years. No adequate explanation can be suggested for this sudden increase in ossification. The boy's height had remained the same, but his weight had increased 6 pounds and there was an undoubted improvement in his general condition. The younger patient was never so marked a case of carpal retardation, having three carpal centers instead of five or six at 5 years of age. He caught up to the normal gradually, so that at 7 years he approached closely to the standard, except for a delay of the distal epiphyses of the ulnas. Whereas the older patient was somewhat below the average for height-weight-age, the younger was somewhat above, tending to be stout. His metabolic rate, however, was slightly above rather than below the average. It may be added that the development of the carpal centers of both parents appeared normal.

Fruit and Vegetable Feeding.—Schultz and his associates state that a study of the iron metabolism of three normal infants, ranging in age from 5 weeks to 7 months, has shown that vegetable (spinach) or fruit (apricots) feeding in addition to the milk formula exerts no significant effect on the amount of iron retained by the infant. Such feeding increased the iron intake from 60 to 171 per cent. The hemoglobin concentration and the number of erythrocytes in the blood were within or above the normal range for infants of this age and were not raised by the vegetable or fruit feeding. A study of the effect of such feeding on an anemic infant, 23 months old, who had been living on an almost exclusive milk diet, has shown a lack of effect in the case of dried spinach but a marked increase in retention of iron when apricots were added to the diet, an effect that disappeared again after wheat germ extract was included. The effect in each case is related to the amount of fecal matter eliminated in the period of metabolism. The hemoglobin concentration and erythrocyte count of the blood were not improved during the course of such feeding. A large increase in the concentration of soluble iron in the diet of the anemic infant, brought about by adding ferric ammonium citrate, resulted in a large increased retention of iron but, up to the end of three weeks on the diet, only a slight increase in the number of erythrocytes had occurred, and practically no change in hemoglobin concentration. When the diet of the anemic infant was further supplemented by liver, the retention of iron was increased still more. The retention in this instance was accompanied by a rise in hemoglobin from 6 to 9.1.

Journal of Thoracic Surgery, St. Louis

2: 533-642 (Aug.) 1933

Presidential Address: Review. G. P. Muller, Philadelphia.—p. 533.
Results of Phrenic Nerve Operations in Two Hundred and Twenty-Two Cases, with Discussion of Technic of Operations. H. R. Decker, Pittsburgh.—p. 538.
*Estimate of Value of Phrenic Nerve Interruption for Phthisis, Based on Six Hundred and Fifty-Four Cases. L. W. Nehil and J. Alexander, Ann Arbor, Mich.—p. 549.
Effect of Phrenicectomy on Cough and Expectoration: Study Based on Elimination of Lipiodol and Foreign Bodies from Lungs. H. A. Carlson, H. C. Ballon, H. M. Wilson and E. A. Graham, St. Louis.—p. 573.
*Behavior of Bronchopulmonary Smooth Muscle as Demonstrated by Electrobronchographic Records: I. Preliminary Report. E. F. Butler, Elmira, N. Y.—p. 589.
Pneumonectomy for Sarcoma of the Lung in Tuberculous Patient. H. Lilienthal, New York.—p. 600.
Changes in Heart and Pericardium Brought About by Compression of Legs and Abdomen. C. S. Beck, Cleveland, and E. F. Bright, Boston.—p. 616.
Removal of Needle from Heart, with Electrocardiograph Records Before, During and After Operation. F. A. C. Scrimger, Montreal, Canada.—p. 629.

Phrenic Nerve Interruption for Tuberculosis.—Of the 654 patients who have had a phrenic operation for tuberculosis from three months to six years ago, the present status of 612, or 93.5 per cent, is known to Nehil and Alexander. Phrenic operation was used alone in 302 cases and, in addition, in three cases of the childhood type of tuberculosis and in three cases

on both sides, but on the second side only after diaphragmatic motion returned following a temporary interruption of the nerve on the first side. Of these, 272 have been traced; 34 per cent are apparently cured or arrested, 35 per cent are apparently arrested, quiescent or improved, 12 per cent are stationary and 5 per cent are worse; 14 per cent of the patients are dead. There were 215 cases with pulmonary cavity in which phrenic paralysis alone was given an adequate opportunity to close the cavity. It succeeded in 38 per cent. In sixty-five of the 181 traced cases in which a phrenic paralysis was used following an unsatisfactory pneumothorax there was no cavity; 42 per cent are arrested and 50 per cent are improved, and 7 per cent of the patients are dead. The cavities of 59 per cent of the 116 patients who had had cavities are closed. Of the forty-seven cavities that remained open, 51 per cent are still open or the patients are dead and 49 per cent have been closed by thoracoplasty, extrapleural pneumonolysis, multiple intercostal neurectomy or scaleniectomy. An initial phrenic paralysis failed to cause satisfactory improvement of sixty-six patients, for whom pneumothorax, thoracoplasty or other supplementary operation was subsequently added. In sixty-seven cases, phrenic operation was used concomitantly with thoracoplasty, extrapleural pneumonolysis, intercostal neurectomy or scaleniectomy. The clinical results obviously owe more to the major operations (except perhaps scaleniectomy) than to the phrenic operation. In the entire series, phrenic paralysis fulfilled the authors' expectation of it, which ranged from mere palliative symptomatic relief to complete arrest of the tuberculosis in 58 per cent, partly fulfilled it in 6 per cent, failed to fulfil it in 30 per cent, and in 5 per cent the result is unknown. Phrenic paralysis was neither directly nor indirectly responsible for the death of any patient. The only severe, permanent complication of the operation was a dyspnea that has persisted for eighteen months. In one case the operation was immediately followed by extension of a few active lesions in the contralateral lung, which was checked by induced pneumothorax. The results have been in limited lesions that were relatively fresh and that contained fibrous tissue that was young enough to be still capable of considerable contraction. The least satisfactory results have been in extensive fibrotic lesions with large stiff-walled cavities. The authors are convinced that phrenic paralysis is of genuine value.

Behavior of Bronchopulmonary Smooth Muscle.—The investigations of Butler corroborate those of Luisada that spontaneous pulmonary contraction can be accepted only when it occurs in lungs isolated from the rest of the body and in the absence of any vagal stimulation. It is more apt to occur in lungs that have been previously inflated to a moderate degree. The author investigated also the response to vagal stimulation, the response to intrapulmonary pressure and the response to external compression. From these observations he concludes that pulmonary systole and diastole has been proved to be a factor in the normal mechanism of respiration, the systole occurring during expiration and aiding in the expulsion of air from the lungs. Stimulation of the vagus causes contraction of bronchopulmonary smooth muscle. The normal stimulus to contraction of bronchopulmonary smooth muscle is distention of the lung by inspiration. An additional stimulus, not encountered under normal conditions, is external compression of lung tissue. Spontaneous contractions may occur in isolated lungs without any external stimulation.

Kansas Medical Society Journal, Topeka

34: 291-332 (Aug.) 1933

Certain Practical Aspects of Nutrition in Childhood. P. C. Jeans, Iowa City.—p. 291.
In Memoriam. J. T. Axtell, Newton.—p. 294.
Tularemia: Summary of One Hundred and Twenty Cases Reported in Kansas. E. G. Brown, J. L. Lattimore and J. C. Hofmann, Topeka. —p. 296.
*Method of Closed Prostatectomy. L. S. Nelson, Salina.—p. 302.

Method of Closed Prostatectomy.—Nelson describes a method for closed prostatectomy in which a transverse incision is made about 1½ inches above the pubis, giving an exposure wide enough for visibility. A catheter is left in the urethra and the prostate is grasped securely with a tenaculum, the capsule is opened posterior to the urethral orifice and the gland is enucleated. Care is used in preserving as much of the capsule as possible. After the gland is enucleated, a hot sponge is placed in the prostatic bed for a few minutes and held there under slight pressure. Then, with a boomerang needle two sutures are placed deep in the prostatic capsule, one at 8 o'clock and one at 4 o'clock with the pubis considered 12 o'clock on the dial; then one or two deep transverse sutures are placed beneath the catheter, passing below the capsule, which may be picked up and elevated somewhat for the placing of these sutures, which pass through the anterior capsule and, after placement, both are tied moderately over the catheter and capsule. Suction may be used to improve visibility. Great care must be used, especially with the lateral sutures, to avoid the rectum. These sutures when properly placed will control hemorrhage. If capsule is abundant, a flap is picked up at 6 on the clock dial and drawn toward the urethra, where it is fastened deep in the prostatic bed. This furnishes a fairly good new posterior urethra. After this is accomplished a silkworm-gut suture is placed through the urethral catheter and not tied, both ends being clamped outside the abdominal wall. The bladder wall is then tightly closed around these two strands of suture with a number 1 ten-day chromic gut in interrupted sutures. A number 2 chromic suture is used for the fascia, plain catgut for the subcutaneous tissue and a nonabsorbable suture for the skin: all these are interrupted sutures. The after-care of the patient is somewhat variable but usually little irrigation is needed. If clots form, irrigation is used moderately and carefully so as not to distend the bladder, which might produce a leak. The author has had no complication, no hemorrhage and no leakage from the bladder.

Laryngoscope, St. Louis

43: 693-776 (Sept.) 1933

The Larynx: I. Practical Anatomic Considerations of the Larynx. J. M. Lore, New York.—p. 693.
Id.: II. Etiology and Treatment of Contact Ulcer of the Larynx. C. L. Jackson, Philadelphia.—p. 718.
Id.: III. Differential Diagnosis of Diseases of the Larynx. J. D. Kernan, New York.—p. 722.
Diathermy: Surgical and Medical in Otolaryngology. L. M. Hurd, New York.—p. 730.
Unilateral Paralysis of Face, Palate and Larynx: Case for Diagnosis. M. Feldman, Brooklyn.—p. 740.
Septic Sore Throat. C. G. Page, Boston.—p. 742.
Teaching Tonsillectomy. J. D. Seiberling, Philadelphia.—p. 748.
*Lateral Sinus Thrombophlebitis with Extension to the Torcular: Report of Two Cases; Operation with Recovery. S. D. Greenfield, Brooklyn. —p. 751.
Headache, Drumhead Retraction and Vacuum Formation. E. R. Lewis, Los Angeles.—p. 762.
Cerebrospinal Rhinorrhea. A. I. Weil and D. R. Womack, New Orleans.—p. 767.

Lateral Sinus Thrombophlebitis.—Greenfield reports two cases. One presented symptoms of an acute surgical mastoid. At operation the author found a large perisinuous abscess: the sinus was bathed in a pool of pus and its wall was thickened and covered with an abundance of mushy granulations. At one point these granulations were necrotic and black. The sinus plate was removed until normal sinus wall was visible in the circumference of the diseased area. Following the mastoidectomy, the patient had a normal postoperative course and, after being afebrile four days, was discharged from the hospital. Two weeks later he had a chill followed by a quick rise in temperature to 105 F. A blood culture taken immediately on admission was reported positive for Streptococcus haemolyticus. The jugular vein was tied and the lateral sinus was opened and drained and a large well organized thrombus was removed from it. At the end of four days the temperature was normal and remained so until the eighth day. Blood cultures taken during this period were reported negative. On the ninth day the patient again had a chill and his temperature rose to 105 F. The blood cultures were again positive for Streptococcus haemolyticus. The mastoid wound was opened and the disease was found to have extended backward, involving the torcular end. The lateral sinus was uncovered backward until healthy sinus wall was encountered. The exposed lateral sinus was incised and drained, and a number of well organized thrombi were removed. After this operation the patient went on to an uneventful recovery. In the other case a diagnosis of thrombophlebitis of the sinus and bacteremia was made before the primary mastoid operation. There was a history of chills, a septic temperature, a recent acute otitis and finally a positive

blood culture soon after admission to the hospital. At the time of operation the otoscope revealed a resolving middle ear. When the jugular vein was ligated, a badly broken down mastoid was found. There was a fistula in the lateral sinus, from which free pus exuded. The sinus was uncovered and all thrombi were removed. Free bleeding was obtained from the torcular end only. After a week of irregular temperature the blood cultures became negative and it appeared as if the patient was going on to an uneventful recovery. However, on the tenth day the patient had a chill, followed by a rise in temperature to 106 F. The blood culture was positive. The wound was reopened and it was found that extension had taken place in the torcular end. The cortex over the lateral sinus was removed until healthy sinus wall was encountered. Some organized thrombi were removed and the diseased portion of the sinus was slit widely open. Free bleeding was obtained from the torcular end only. The patient then went on to recovery after a ten-day stormy course.

New England Journal of Medicine, Boston

209: 319-366 (Aug. 17) 1933

Causes of Deaths from Heat in Massachusetts. G. C. Shattuck and Margaret M. Hilferty, Boston.—p. 319.
Diagnosis and Treatment of Pernicious Anemia. W. P. Murphy, Boston. —p. 329.
Diagnosis and Treatment of Secondary Anemia. W. P. Murphy, Boston. —p. 331.
Pelvic Infection in Women. L. E. Phaneuf, Boston.—p. 334.
Primary Carcinoma of Bronchus: Report of Two Cases; Diagnosis by Bronchoscopy and Biopsy. G. A. Rice, Holden, Mass.—p. 341.
What We Have Learned from Five Hundred Spinal Anesthesias. F. H. Washburn, Holden, Mass.—p. 345.
President's Address. H. O. Chesley, Dover, N. H.—p. 349.
Urinary Retention: Outline of Causes and Treatment. P. J. Doyle, Dover, N. H.—p. 351.

209: 367-418 (Aug. 24) 1933

Cysts of the Prostate. R. C. Graves and C. J. E. Kickham, Boston.—p. 367.
Metaplasia in the Penis: Presence of Bone, Bone Marrow and Cartilage in the Glans. V. Vermooten, New Haven, Conn.—p. 368.
Some Hermaphrodites I Have Met. H. H. Young, Baltimore.—p. 370.
Anal Fistula. E. P. Hayden, Boston.—p. 376.
Cholesterol to Cholesterol Ester Ratio in the Plasma of Diabetics with Advanced Arteriosclerosis. C. B. F. Gibbs, Elizabeth Buckner and W. R. Bloor, Rochester, N. Y.—p. 384.
Multiple Causes of Seizures in the Individual Epileptic Patient. W. G. Lennox, Boston.—p. 386.
Treatment of Amnesia: Case Report. B. Cohen, North Grafton, Mass. —p. 389.
The Progress of Nutrition. F. L. Burnett, Boston.—p. 392.

New Jersey Medical Society Journal, Orange

30: 517-598 (Aug.) 1933

Economic Relations of Medicine. W. H. Ross, Brentwood, Long Island, N. Y.—p. 517.
Are We Approaching a New Era in Medicine? J. B. Morrison, Newark. —p. 525.
Discussion of Our Economic Problem. J. A. Hartwell, New York.—p. 532.
Id. E. S. Sherman, Newark.—p. 540.
*Value of Calcium as a Preoperative Agent in the Postoperative Course of Surgical Patients. C. H. Evans, East Orange.—p. 542.
Salicylates in Rheumatic Fever. H. Brooks, New York.—p. 550.
Putting on Weight with Insulin. G. Ginsberg, Hoboken.—p. 555.
Importance of the Study of Human Constitution in Practice of Medicine. F. Hnat, Elizabeth.—p. 557.
Hypertension. L. Mancusi-Ungaro, Newark.—p. 559.
Mesenteric Vascular Occlusion. A. B. Abrams, Newark.—p. 564.
The Otorhinolaryngologist: His Work and His Place in Medicine. I. W. Voorhees, New York.—p. 567.
Medical Economic Problems. R. L. McKiernan, New Brunswick.—p. 569.
Recent Advance in Clinical Study of Endocrine Disturbances in Women. Rita S. Finkler, Newark.—p. 570.
Medical Economics. F. A. Faught, Philadelphia.—p. 573.
Relation of Outpatient Department to Medical Economics. L. W. Deichler, Philadelphia.—p. 577.

Value of Calcium in Preoperative Preparation.—Evans presents a preliminary report on the routine use of calcium in preoperative preparation. Each adult patient is instructed to eat a sufficient amount of plain food (meat once a day, not fried), to drink at least one glass of milk with each meal, six glasses of orange juice daily, 2 and 3 ounces of stick candy daily, to take deep breathing exercises at least three times each day, to see that the bowels move every twenty-four hours and to sleep at least nine hours each night. On the morning of the third day before operation, each adult patient receives a sufficient amount of calcium so that there will be a slight hypercalcemia at the time of operation: 3 Gm. of calcium gluconate by mouth immediately after each meal. On the night before operation, 10 cc. of a sterile 10 per cent solution of calcium gluconate is given intramuscularly and a sufficient amount of alkali so that the urine will be slightly alkaline on the morning of operation. A plain soapsuds enema is given on the evening before operation, and at bedtime 0.1 Gm. of phenobarbital is given by mouth. Three quarters of an hour before the operation each patient receives from 0.008 to 0.016 Gm. of morphine sulphate intramuscularly. After the operation, a retention enema of from 500 to 800 cc. of tap water is given. As soon as the patient begins to react from the anesthesia, 10 cc. of a 10 per cent sterile solution of calcium gluconate is given intramuscularly and the patient is placed in a slight Fowler position. No abdominal binders or tight abdominal dressings are used. Fluids, if desired, are given immediately after operation. The patient is turned on the side every three or four hours and during the first four or six days is made to take a series of deep breaths three or four times a day. During the first three or five days, especially in upper abdominal operations, a sufficient amount of morphine sulphate is given intramuscularly to prevent any sharp pain, restlessness or fear. A small rectal tube is used if there is any distention. Enemas or cathartics are given on the third or fourth day after operation. Patients are catheterized if they do not void within twelve hours after the operation, and every eight hours until they void voluntarily. Dressings are not changed except to remove drains and sutures.

Philippine Islands Med. Association Journal, Manila

13: 375-410 (Aug.) 1933

Malignancy Among Filipinos: II. Incidence Based on Autopsy Materials Collected in Twenty Years (1907-1927). W. de Leon, Manila. —p. 375.
Lectures on Malaria Prophylaxis and Mosquito Control. P. F. Russel, Manila.—p. 381.

Radiology, St. Paul

21: 207-310 (Sept.) 1933

Pulmonary Emphysema Associated with Arrested Pulmonary Tuberculosis. K. Dunham, Cincinnati.—p. 207.
Recommendations of Third International Congress of Radiology Relating to Protection from X-Rays and Radium. L. S. Taylor, Washington, D. C.—p. 212.
Shall We Record and Report All X-Ray Dosage in Roentgens? R. R. Newell, San Francisco.—p. 216.
Roentgenologic Examination of Digestive Tracts of Infants and Children. L. T. LeWald, New York.—p. 221.
Diagnosis of Extragastro-Intestinal Abdominal Masses. L. G. Rigler, Minneapolis.—p. 229.
Changes in Susceptibility of Drosophila Eggs to X-Rays: I. A Correlation of Changes in Radiosensitivity with Stages in Development. P. S. Henshaw and C. T. Henshaw, New York.—p. 239.
Atelectasis as Complication of Pulmonary Tuberculosis. E. A. Gatterdam, Phoenix, Ariz.—p. 251.
*Whole Animal Exposures to Highly Filtered Gamma Rays. W. G. Whitman, Baltimore.—p. 265.
Some Applications of Physical Therapy in Medicine. L. J. Gelber, Newark, N. J.—p. 274.
Congenital Nonrotation of the Colon: Case Report. M. Golob, New York.—p. 277.
The Thoracic Surgeon and His Radiologic Co-Worker. W. A. Hudson, Detroit.—p. 283.
Depth Dose Calculations for Supervoltage X-Rays. M. A. Tuve, Washington, D. C.—p. 289.

Whole Animal Exposures to Gamma Rays.—In order to determine some of the biologic effects of whole body exposure to penetrating x-rays, unaccompanied by softer radiation, of practical interest in connection with the recent development of high voltage roentgen tubes, Whitman exposed a group of sixty-seven rats to the radiation from 6 Gm. of radium highly filtered by 16 mm. of lead, 1 mm. of platinum, 1 mm. of brass and 5 mm. of celluloid. Another group of sixteen rats was exposed to 2.5 Gm. of radium filtered by 1 mm. of platinum and 1 mm. of brass, giving a similar exposure to the hard gamma-rays, with the addition of such soft components as penetrate 1 mm. of platinum and 1 mm. of brass. The lethal exposure was found to be four hours for 6 Gm. of radium, with filters, for a distance of 62 mm. to the midposition of the rat. The minimum exposure which could be detected by blood counts was found to be from one twentieth to one thirtieth of a lethal dose. For rats that have reached maturity before exposure, the sterilizing dose does not appear to be less than the lethal dose.

Breeding experiments were carried out with the result that the first progeny of rats exposed to more than one tenth of a lethal dose showed a small increase in the number of abnormal offspring. Dental films enclosed in a 7 mm. lead casette were calibrated in terms of the lethal rat dose to serve as a more sensitive measure of the amount of exposure of laboratory workers to such hard radiations.

Science, New York

78: 177-196 (Sept. 1) 1933

Bacteria as Food for Vertebrates. V. Burke, Pullman, Wash.—p. 194.
*Localization of Spirochaeta Pallida in the Brains of Rabbits Following Intraspinal Injection of Testicular Tissue and Physiologic Salt Solution. G. W. Raiziss and Marie Severac, Philadelphia.—p. 195.

Localization of Spirochaeta Pallida.—Raiziss and Severac attempted to render the central nervous system of the rabbit more easily penetrable to spirochetes by injection of normal testicular extract. Six rabbits received an intraspinal injection of an emulsion of testicular tissue of normal rabbits. Three were inoculated intratesticularly and three intravenously, by the usual method, with syphilitic testicular tissue (Nichols strain). From six to seven weeks later testicular lesions appeared and, when the brains of the animals were removed and emulsions prepared from them were injected into testicles of normal rabbits, positive results (lesions containing numerous active spirochetes) were obtained in all the six animals. This was complicated by the somewhat unexpected fact that a positive result was also obtained with one animal injected intraspinally with physiologic solution of sodium chloride. This renders the interpretation of the results obtained somewhat uncertain. In order to determine whether the effect may not possibly be due to the traumatic shock of the injection, experiments are now in progress in which distilled water and also a number of other substances are being injected intraspinally. The net result is that spirochetes may be induced to penetrate into the central nervous system of rabbits with the aid of an intraspinal injection of normal testicular tissue or (in one case) physiologic solution of sodium chloride.

South Carolina Medical Assn. Journal, Greenville

29: 203-218 (Sept.) 1933

Treatment of Skull and Brain Injuries. A. J. Buist, Charleston.—p. 206.
Rocky Mountain Spotted Fever in South Carolina. O. B. Mayer, Columbia.—p. 209.

Texas State Journal of Medicine, Fort Worth

29: 233-294 (Aug.) 1933

Complementary Action of Certain Antiedemic Drugs. E. H. Schwab, G. Herrmann and C. T. Stone, Galveston.—p. 240.
Primary Carcinoma of the Lungs: Report of Ten Cases. J. F. Pilcher and P. Brindley, Galveston.—p. 247.
Use of Insulin in Malnutrition in Adults. E. V. DePew, San Antonio.—p. 254.
Blood Sugar in Allergic Persons. J. H. Black, Dallas.—p. 257.
Rectal Complications of Pregnancy. O. S. McMullen, Victoria.—p. 260.
Recent Advances in Our Knowledge of Primary Anemia. W. H. Potts, Jr., Dallas.—p. 263.
Wax As a Nasal Packing. R. T. Canon, Lubbock.—p. 266.
Neoplasms of Reticulo-Endothelial Origin. G. T. Caldwell, Dallas.—p. 268.
X-Ray Radiation in Treatment of Uterine Hemorrhage. D. L. Hess, San Angelo.—p. 275.
*Specificity of the Weil-Felix Reaction. H. A. Kemp, H. E. Wright and Faith Wayne, Dallas.—p. 278.

Weil-Felix Reaction.—During the past year and a half Kemp and his associates have been doing Weil-Felix tests on serum from cases of typhoid, paratyphoid and undulant fever. Their work has shown that the Weil-Felix reaction may be "positive" in conditions other than typhus. They recognize the importance of dissociation in the handling of their stock antigens. They are willing to accept the use of an O type antigen because of an added degree of specificity. They do not, at this time, possess a clear understanding of the mechanism of the Weil-Felix test. Nevertheless, they appreciate its great practical value for two reasons: guinea-pig inoculation in the diagnosis of typhus is so fraught with difficulties that it is impossible in the large number of cases in which facilities for this maneuver are lacking, and in typhus fever the Weil-Felix reaction becomes positive at relatively high titers (1:240, 1:320, 1:640) early in the disease. These titers will increase as time passes. Increasing titers of agglutination make a nonspecific test a specific test—one of diagnostic importance. Agglutinating titers in the Widal reaction, or in the quantitative Huddleson, or in tests against known strains of dysentery organisms increase during the course of these illnesses. The same increase will take place in the agglutinating titers of the Weil-Felix test both in typhus and in Rocky Mountain spotted fever (Parker and Davis). Therein lies the specificity of the Weil-Felix reaction: early positive reaction with increasing agglutinating titer.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

41: 485-546 (Sept.) 1933

*Advantages and Technic of Preliminary Hemostasis in Thyroidectomy. M. Nordland and L. M. Larson, Minneapolis.—p. 485.
Dangers of Air Embolism in Thyroidectomy. D. Guthrie and R. L. Evans, Sayre, Pa.—p. 497.
Further Observations on Parathyroid Protection. W. I. Terry and H. H. Searls, San Francisco.—p. 507.
Diseases of the Thyroid in Children. R. B. Cattell, Boston.—p. 516.
*Hyperthyroidism Associated with Pregnancy. J. A. Lehman, Philadelphia.—p. 524.
Preoperative and Postoperaive Treatment of Bad Risk, Plus Four, Toxic Goiter. S. J. Waterworth, Clearfield, Pa.—p. 531.

Hemostasis in Thyroidectomy.—To prevent injuries to the laryngeal nerves or parathyroids, hemorrhage and infection, Nordland and Larson recommend and describe extrafascial ligation of the inferior thyroid arteries preliminary to thyroidectomy. By a careful anatomic dissection, structures may be accurately defined and the advantages of hemostasis gained. The usual type of incision for goiter is made and the flaps containing the platysma and superficial fascias are reflected upward and downward. The medial border of the sternocleidomastoid muscle is dissected free in its lower midportion and the margins are retracted outward. Directly underneath, the fascia of the prethyroid muscles is exposed and at the margin of the sternomastoid a vertical slit about 3 cm. in length is made in the superficial layer of the deep cervical fascia. The outer cut edge of this fascia is retracted laterally and the index finger is carried posteriorly until it is possible to palpate the transverse processes of the cervical vertebrae. The inferior thyroid artery is found running medially at right angles from the carotid artery at the level of the sixth cervical vertebra. A linen ligature on a carrier is readily placed about the artery and the vessel ligated by thrusting the carrier around the superior pole, starting from the trachea and proceeding to the lateral margins of the gland. Blunt ligature carriers are far superior to the application of artery forceps. It is advantageous to guide the carrier with the finger in order to include only the amount of tissue desired. Ligation may be made in this manner either doubly or singly without danger to the superior laryngeal nerve. The authors have carried out preliminary ligature of all four arteries to the thyroid in 168 cases and state that with proper preliminary hemostasis the operative field is drier, the incidence of injury to the recurrent laryngeal nerves is definitely decreased, fewer ligatures on bleeding vessels are necessary, postoperative wound drainage is less in amount, and a better cosmetic as well as functional result is uniformly obtained. The particular indication for preliminary ligation of the inferior thyroid arteries exists in the case of recurrent toxic goiters in which secondary operations are especially prone to be complicated by nerve injury, hemorrhage and infection. Improvements in results as well as facilitation of technic have been found to accompany the procedure in this type of case. Nutrition to the parathyroid bodies is not impaired following this type of ligation.

Hyperthyroidism and Pregnancy.—Lehman states that in order to protect the patient during the subsequent months of gestation and during labor it is necessary to control the hyperthyroidism. A properly conducted thyroidectomy is much more satisfactory and is attended with less risk than an interruption of pregnancy. Of the author's thirty-three cases, five could not be traced, twenty-three patients went to full term and were delivered of healthy offspring, two required cesarean section but bore healthy babies, one was delivered at eight months of a hydrocephalic monster, in one the pregnancy was interrupted because she was too weak for the ordeal of labor, and one patient died of cardiac failure one month after lobectomy, from an acute exacerbation of a long-standing hyperthyroidism.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 321-364 (Aug. 19) 1933

Occupational Dermatitis. W. G. Harvey.—p. 321.
Occupational Diseases of the Skin. J. C. Bridge.—p. 324.
Rôle of Fusion Operations as Applied to the Hip Joint. M. S. Henderson.—p. 327.
*Para-Esophageal Diaphragmatic Hernia. N. C. Lake.—p. 331.
*Electrosurgical Treatment of Minor Anal Conditions. W. A. Mein.—p. 332.

Para-Esophageal Diaphragmatic Hernia.—Lake describes an operation for para-esophageal diaphragmatic hernia and reports a case in which the operation was performed. After four years there has been no recurrence of symptoms. With the patient under tracheal ether anesthesia, an epigastric, paramedian laparotomy was performed; the constriction of the stomach, where it passed through the diaphragm, was examined and no evidence of permanent damage to the wall was found. There were no intrasaccular adhesions and the stomach was easily reduced into the abdomen after the admission of air to the sac. The peritoneal sac was passed through the diaphragm immediately to the left of the esophagus and aorta (corresponding to a para-esophageal defect), which was about 2½ inches wide by 5 inches long. The sac could not be inverted into the abdomen, and efficient repair of the aperture from the abdominal aspect appeared unlikely. Therefore the abdominal wound was packed and the patient turned on his right side for thoracotomy. The eighth rib was resected for practically its whole extent through a long incision extending back to the spinous processes. The pleura was opened and the lung was allowed to collapse by reduction of the intratracheal pressure. After protective measures were applied, the lung was retracted upward and the heart somewhat forward. A thin fibrous layer that covered the peritoneal sac was incised and, the greater part of the sac having been removed, the aperture was closed by a ring catgut suture. The muscular defect was closed by the use of tendinomuscular strips cut from the semispinalis muscles at the vertebral end of the incision. Six of these sutures were "darned" over the aperture without strain, the Gallie technic for fascial sutures being used. The esophagus was slightly short, but the level of closure was carried upward as the esophagus was approached. The reflected pleura was sutured over the fascial "raft" and the superficial wound was closed in the usual manner, the pleural cavity being completely emptied of air by raising the intratracheal pressure and so expanding the lung before the last pleural suture was tied. The patient was turned again on his back and the stomach was anchored to the anterior abdominal wall, after the fashion of a Rovsing gastropexy, before the abdomen was closed. Convalescence was uneventful. The patient left the hospital forty days after admission, taking all food without discomfort.

Electrosurgical Treatment of Anal Conditions.—For anal fissures Mein uses the monopolar or Oudin current. After anesthesia, a rectal speculum is introduced and the fissure located and "sprayed" with this current. The dehydrated eschar is left in place. From three to four days after the operation, the anus is gently swabbed out with a mild antiseptic. The patient is allowed up on the day after the operation. In anal polyps, perianal anesthesia is administered and the polyp is brought down. If the base is higher than the line of perianal anesthesia, it is injected with a local anesthetic. A pair of curved artery forceps are applied to the base of the pedicle. The polyp distal to the forceps is severed with the cutting current. The electrode is then applied to the point of the forceps and the coagulating current turned on until a zone appears proximal to the forceps. If the base is broad, a catgut ligature should be applied. If the polyp is above the line of peritoneal reflection, the ultimate slough will extend beyond the coagulated area visible at the time of operation. If too heavy or too prolonged a current is used, a perforation into the peritoneal cavity may result. The patient can be discharged in a week or ten days. In anal fistulas, local anesthesia is administered as usual. A soft phosphor bronze wire about 3 inches in length is used as the positive electrode. The wire is introduced down the sinus in its entire length until a finger in the rectum feels the end of the wire just under the rectal mucous membrane. The wire is withdrawn about one-fourth inch and a medium coagulation current is passed until the skin shows signs of coagulation. With the current still on, the wire is withdrawn and a dry dressing is applied. The patient is allowed up on the following day. In hemorrhoids, after anesthesia, some gauze is rolled into a pear-shaped mass and inserted up the anus beyond the hemorrhoid-bearing area. Traction is made on it. A needle, bent to form a small arc of a large circle, is used as the electrode. Each hemorrhoid is punctured at the distal end, and the electrode is inserted for a distance of about one-half inch. The coagulation current is turned on until an area of coagulation appears at the entrance. About the same time the hemorrhoid proceeds to "boil." The electrode is removed with the current still on. In cases of thrombosed hemorrhoids, the ordinary straight needle is used. The hemorrhoid is opened with a cutting current and the clot is evacuated by sponging. A ball electrode is then used, and the interior of the hemorrhoid is thoroughly sprayed with the coagulating current. Any anal tags are excised with the cutting current. The wound is dressed with a pyramidal dressing. The patients are permitted to get up on the fifth day and discharged on the seventh day. Postoperatively, the bowels are not allowed to act up to seven days. This may vary, the criterion being the tolerance of the patient. On the sixth night cascara is given and, half an hour before the bowels act on the following day, from 4 to 6 ounces of warm olive oil is slowly injected into the rectum and retained.

Journal of Hygiene, London

33: 295-434 (Aug.) 1933

Effects of Colloidal Silica on Experimental Tuberculosis in Guinea-Pigs. S. L. Cummins and Cicely Weatherall.—p. 295.
Silicotic Lungs: Minerals They Contain. W. R. Jones.—p. 307.
Influence of Radiant Heat and Air Movement on Cooling of Katathermometer. T. Bedford and C. G. Warner.—p. 330.
Use of Katathermometers for Measurement of Equivalent Temperature. A. F. Dufton.—p. 349.
Control of Scarlet Fever by Active Immunization. J. S. Faulds.—p. 353.
Contributions to Experimental Study of Epidemiology: Study of Cage Age and Resistance to Environment. A. B. Hill.—p. 359.
Genetic Predisposition to Bacillus Piliformis Infection Among Mice. J. W. Gowen and R. G. Schott.—p. 370.
Agglutinins for Typhoid-Paratyphoid Group in a Random Sample of the Population of British Guiana. G. Giglioli.—p. 379.
*Agglutinins Found in the Serum of Subjects Inoculated with Typhoid-Paratyphoid Vaccine. G. Giglioli.—p. 387.
Fatty Infiltration of Liver of Mice Resulting from Ingestion of Medical Liquid Paraffin, etc. C. C. Twort and J. M. Twort.—p. 396.
Microbic Dissociation: Detection of the R Variant by Means of a Specific Drop Agglutination. E. J. Pampana.—p. 402.
*Selective Mediums for Isolation, Cultivation and Differentiation of Bacillus Coli and Bacillus Lactis-Aerogenes. W. J. Wilson.—p. 404.
Inactivation of Bactericidal and Hemolytic Complement on Standing. J. Gordon and L. Hoyle.—p. 411.
Different Types of Corynebacterium Diphtheriae. J. Menton, T. V. Cooper, F. W. Duke and W. H. Fussell.—p. 414.
Statistics of Erysipelas in England and Wales. W. T. Russell.—p. 421.

Typhoid-Paratyphoid Agglutinins.—The results of Giglioli confirm those of Gardner that typhoid-paratyphoid inoculation gives rise to production of somatic agglutinins. This reaction is marked in the first few weeks following vaccination, but it is always limited to low and medium dilutions; the highest titer at which a positive result was recorded in the author's series of cases with an O antigen was 1:320. In actual typhoid infection, H agglutinins usually occur in much higher titers than the corresponding O agglutinins; but even so the O titers found in typhoid patients are generally much higher than the O titers found in vaccinated subjects, especially after more than two months has elapsed from the date of vaccination. Smith, in his recent work on cases of typhoid and paratyphoid B, has shown that a single test may not be sufficient for the demonstration of somatic agglutinins. Repeated tests invariably revealed their existence, usually in considerable titers (from 1:100 to 1:400). In the author's experience with typhoid (four cases) and paratyphoid C (twelve cases), O agglutinins have been found constantly after the first week of the disease in dilutions from 1:80 to 1:2,560, usually appearing at a somewhat earlier date in the course of the disease than the corresponding H agglutinins. The presence of O agglutinins in the serums of vaccinated subjects does not destroy the utility of qualitative receptor analysis as a means for the serologic diagnosis of typhoid in vaccinated

subjects; but it is necessary to make this a quantitative as well as a qualitative test by establishing the end titer of agglutination for each antigen. The test should be repeated after an interval of a week or more in negative or doubtful cases. In the diagnosis of typhoid in vaccinated subjects, one should not expect much from serologic methods during the first three months following inoculation; but after this period has elapsed the finding of O agglutinins in a high dilution suggests active infection; negative observations, on the other hand, have little value unless confirmed by repeated tests, carried out at intervals of five or six days.

Mediums for Differentiation of Bacillus Coli and Bacillus Lactis-Aerogenes.—Wilson describes an agar medium that enables one to make a direct estimation of the numbers of coliform bacilli in a water or milk sample. An enrichment medium for Bacillus lactis-aerogenes is one containing in every 100 cc. of peptone water 0.5 Gm. of sodium citrate, 0.25 Gm. of soluble starch and 1 cc. of a 1 per cent watery solution of neutral red. Enrichment mediums for B. coli are: (1) lactose peptone water containing in every 100 cc. 1 Gm. of anhydrous sodium sulphite and 2 cc. of a 1 per cent solution of rosolic acid in absolute alcohol; and (2) lactose peptone water containing in every 100 cc. 2 cc. of a 40 per cent solution of methenamine in water. A medium consisting of 100 cc. of water, 10 Gm. of peptone, 1.25 Gm. of soluble starch sterilized at 115 C. for fifteen minutes and 5 cc. of Andrade's indicator was found useful in the differentiation of B. coli and B. lactis-aerogenes. Of twenty-three strains of B. coli tested, twenty-one gave entirely negative results, while two, after an incubation period of a few days, produced an acid reaction. Of these two, one was isolated from the urine in a case of cystitis and one from feces, and both appeared to be pure cultures. Of forty-four strains of B. lactis-aerogenes tested, thirty-eight produced acid and gas and six were negative. The addition of starch to the citrate neutral red peptone water medium proved of advantage in practice. In a medium containing 1,000 cc. of water, 10 Gm. of peptone, 1.25 Gm. of soluble starch, 5 Gm. of sodium citrate and 10 cc. of a 1 per cent solution of neutral red, twenty-nine strains of B. coli failed to grow, whereas forty-eight strains of B. lactis-aerogenes gave good growth, resulting often in the bleaching of the medium.

Journal of Mental Science, London

79: 433-562 (July) 1933

The Fourteenth Maudsley Lecture: British Influences in Psychiatry and Mental Hygiene. A. Meyer.—p. 435.
The Thyroid Gland in Mental Deficiency: Histologic Study. J. L. Newman.—p. 464.
The Blood Urea in Psychotics. D. N. Parfitt.—p. 501.

Journal of Tropical Medicine and Hygiene, London

36: 217-232 (Aug. 1) 1933

Symptomatology of Yaws in Liberia: Details of Statistical Method Used in This Study. G. W. Harley.—p. 217.
Some Observations on Bacteriologic Examination of Stools. A. M. Gohar.—p. 224.

Lancet, London

2: 393-448 (Aug. 19) 1933

Unsuccessful Appendicectomy. A. Edmunds.—p. 393.
Mechanical Basis of Periodicity in Wuchereria Bancrofti Infection. C. Lane.—p. 399.
*Wuchereria Bancrofti Infection: Two Case Reports. F. W. O'Connor and C. R. Hulse.—p. 404.
Further Observations on Biochemistry of Asthmatic Conditions, with Especial Reference to Urinary "Proteose." G. H. Oriel.—p. 406.
Electrocardiographic Changes in Toxic Polyneuritis. S. B. B. Campbell and R. S. Allison.—p. 410.
*Meningitis Due to Hemophilic Organisms. H. S. Carter and Catherine M. Macleod.—p. 412.

Wuchereria Bancrofti Infections.—O'Connor and Hulse excised the lymph nodes in two cases diagnosed as filarial, with a view to recovering adult filarial worms. Both operations were performed before midday and it was predicted as the result of previous observations that, if living Wuchereria bancrofti females were present, parturition would not have taken place but would be imminent or just beginning. The prediction proved to be correct in both cases. In the first case, the glands were excised at 11:30 a. m. and microfilariae were found in the vagina and, in small numbers, in the lymph canals close to the vulva. In the second case, while microfilariae were also found in the vagina, no embryos had reached the exterior of the parent worm before operation. In both cases, apparently healthy microfilariae and microfilariae and eggs in various stages of degeneration were found in the afferent radicles and cortical sinuses of lymph nodes. In a separate group of glands in the second case, healthy and degenerating microfilariae but no eggs were found in similar situations. This confirms O'Connor's previous observations that microfilariae reaching a lymph node along the lymphatic vessel containing the parent female may be destroyed in the gland. Apparently, destruction of microfilariae and eggs in the glands may take place by disintegration and absorption as well as by calcification. How eggs in addition to microfilariae may reach a lymph node is not clear, but it seems possible that, independent of abortion, a few eggs may pass to the exterior of the worm following the stream of microfilariae through the vagina at the end of parturition. If the parent worm is at some distance from the gland, it is conceivable that the nearly developed eggs will have completed development in the lymphatic canals and, having stretched the chorionic membrane, be transformed into completely developed microfilariae by the time they reach the gland. The numbers of microfilariae circulating in the blood at night in the second case were not immediately diminished after operation but were at first increased and later decreased. The authors suggest that the initial increase in numbers may have been due to the removal of the gland filters when the embryos had been destroyed, so that the parasites would reach the circulation in increasing numbers through the walls of the lymph nodes, a possibility that has already been demonstrated by O'Connor. Subsequently, owing to the obstruction of the lymphatic vessel by gland excision, stasis of lymph would probably occur followed by lymph thrombosis, occasioning death of the parent worm or worms. A diminution in the number of microfilariae in the night blood would naturally ensue. The microfilariae still found in the blood at night probably come from other filariae beyond the scope of the two operations. In both cases, microfilariae and eggs were found in the cortical sinuses and substance of lymph nodes, where they were undergoing degeneration.

Meningitis Due to Hemophilic Organisms.—Carter and Macleod present three fatal cases of meningitis due to so-called hemophilic organisms. The organisms differ in several respects morphologically, culturally and biologically from the classic coccobacillus of Pfeiffer, though some relationship probably exists. The identity of Pfeiffer's bacillus with certain influenza-like organisms occurring in so-called influenzal meningitis, leptothrix meningitis and septicemic cerebrospinal meningitis has been doubted by several writers, as Cohen, Henry, Braxton Hicks and Dible. The samples of cerebrospinal fluid from the three cases were all similar in character, moderately turbid with light purulent deposits. Microscopically, each contained large numbers of leukocytes, most of which were polymorphonuclear in type, and many pleomorphic gram-negative bacilli.

Chinese Medical Journal, Shanghai

47: 735-850 (Aug.) 1933

Treatment of Acute Appendicitis. J. A. Snell.—p. 735.
Treatment of Acute Gonorrheal Epididymitis. Z. M. Kau.—p. 740.
Study of Meningococci Isolated in China. F. F. Tang and S. Y. Yang.—p. 747.
Eclampsia as Seen in Canton, South China. H. E. Scheyer.—p. 758.
Zondek-Aschheim Test for Early Pregnancy. S. O. Eum.—p. 764.
Chinese Leprosy Cases in the United States National Leprosarium: Clinical and Laboratory Study of Thirty-Six Patients with Seven Autopsy Reports. D. G. Lai.—p. 772.
Development of Our Knowledge of Valvular Disease of the Heart. F. R. Dieuaide.—p. 785.
The Papworth Village Settlement for Tuberculous: Its Interest for China. H. S. Gear.—p. 805.
Phyllodistomum in Shrimps. Mary N. Andrews.—p. 813.

Journal of Oriental Medicine, South Manchuria

19: 1-12 (July) 1933

Flocculation of Serum Proteins by Colloidal Fatty Acid. S. Imai.—p. 1.
So-Called Latent Form of Peptic Ulcer. T. Matsui and G. Irie.—p. 7.
Studies on Toxin of Bacillus Typhosus: Part IV. Influence of Refined Toxin on Leukocytes Picture of Rabbits. M. Yato.—p. 8.
Uterus Bicornis: Seven Cases. K. Saito.—p. 9.
Hydropericardium from Multiple Cardiac Metastases of Primary Cancer of Liver: Case. Y. Jono and K. Matsuoka.—p. 10.
Cesarean Section. M. Sasaki.—p. 12.

Paris Médical

2: 245-280 (Oct. 7) 1933

Neurology in 1933. A. Baudouin and H. Schaeffer.—p. 245.
Total Syndrome of Right Anterior Cerebral Artery in Right Handed Patient. G. Guillain and P. Mollaret.—p. 256.
Early Amyotrophy in Tumors of Parietal Lobe. L. van Bogaert.—p. 261.
*Semeiologic Study and Practical Value of Queckenstedt-Stookey's Test in Nervous Diseases. H. Roger and J. Alliez.—p. 264.
*Pseudotumoral Syphilis of Spine: Dissociated Action of Treatment on Meningeal or Spinal Lesions. C. Launay and G. Poumeau-Delille.—p. 271.
Influence of Stimulants on Visual Reaction Time to Auditory Signal. R. Jonnard and Mlle. L. Maire.—p. 273.
Catatonia, Pathologic Sleep and Oneirism from Colibacillary Intoxication. H. Baruk.—p. 278.

Value of Queckenstedt-Stookey's Test in Nervous Diseases.—Roger and Alliez studied the manometric curves obtained by Stookey's method of eliciting and registering the Queckenstedt sign in many diseases of the central nervous system. In normal persons the pressure of the cerebrospinal fluid rises from 30 to 40 cc. in from ten to twelve seconds after compression of the jugular vein. Its descent does not exceed fifteen seconds. In pathologic conditions there may be complete block of the subarachnoid passages, in which case compression of the jugular vein produces no rise of pressure or only a few centimeters. Partial block exists when the pressure of the cerebrospinal fluid rises only 15 cc. in twenty seconds and requires more than twenty-five seconds to descend to its initial level. Cases in which intermediate curves are obtained must be considered doubtful. In spinal compression the block is almost always complete, whether the compression is due to Pott's disease, cancer of the spine, pachymeningitis or similar conditions; it may be partial in the early stage of a spinal tumor or a recent, slight compression. Block probably depends not only on the volume of the tumor but on the arachnoid reaction associated with it. In a tumor without congestive reaction, block may be absent. Partial block is much more frequent in arachnoiditis than in compression from any other reason. Chronic myelitis and multiple sclerosis never produce a complete block, but the rise of pressure of the cerebrospinal fluid is usually retarded, indicating a partial block. Amyotrophic lateral sclerosis and tabes produce only insignificant modifications of the manometric curve. In syringomyelitis the graphs may be normal or depict total or partial block, probably depending on the degree of gliosis and hypertrophy; in radiculitis, on the other hand, the graph is always normal. In spinal diseases the complete block has an absolute value, but partial block must be interpreted in relation to other symptoms. A normal manometric curve does not rule out compression, since certain subarachnoid strictures have little influence on the cerebrospinal fluid. The Queckenstedt-Stookey test usually confirms the roentgenographic results but does not furnish such accurate diagnostic information. In encephalic disease the test must be employed cautiously, as it is not without danger in intracranial hypertension. It may have important therapeutic consequences, as the demonstration of an occipital block is an indication for ventricular puncture in cerebrospinal meningitis as well as in cranial trauma. In the latter case it is essential to know whether a complete or partial block exists before deciding on surgical procedure. In cerebral tumors the high degree of hypertension makes the use of Stookey's method difficult. The test is not modified in epilepsy, Parkinson's disease and dementia paralytica. The test is a valuable supplement to the study of the spinal fluid and to spinal roentgenography in spinal, meningeal and encephalic diseases.

Pseudotumoral Syphilis of Spine.—Launay and Poumeau-Delille discuss the inconstant action of antisyphilitic therapy in pseudotumoral syphilis of the spine, the term applied by them to syphilitic pachymeningitis, which is generally localized in the lumbar region and which may or may not be associated with syphilitic myelitis. They think that the existence of the myelitis and its mode of reaction to treatment are prime factors in determining this difference in the response of the patient. They report a case that illustrates the dissociated action of treatment in combined meningeal and spinal disease of syphilitic origin. The patient had a syphilitic paraplegia associated with a syndrome of incomplete compression of the dorsal region. This syndrome consisted of intercostal pains of the radicular type, relative albuminocytologic dissociation and partial block (revealed by the Queckenstedt-Stookey test). Under the influence of antisyphilitic treatment the radicular pains disappeared, the circulation of the cerebrospinal fluid returned to normal and the hyperalbuminosis of the spinal fluid disappeared. From this the authors conclude that the syndrome of compression was probably due to arachnoiditis of the dorsal region which receded following antisyphilitic treatment. The severe paraplegia persisted undiminished despite continued treatment. The unique motor symptoms that persisted must have been due to the subjacent syphilitic spinal sclerosis, which is not amenable to treatment.

Presse Médicale, Paris

41: 1585-1600 (Oct. 14) 1933

Treatment of Angina by Certain Amino-Acids. P. Halbron, J. Lenormand and P. Dartigue.—p. 1585.
*Study of Circulatory System and Cardiac Function by Registration of Arterial Pressure. R. Giroux and G. Boulitte.—p. 1586.
*Experimental Colibacillary Catatonia and Colibacillary Psychoses. H. Baruk.—p. 1588.

Study of Arterial Pressure.—Giroux and Boulitte describe a new instrument, perfected by the latter, which registers the absolute value of the arterial pressure at each moment of the cardiac contraction in the form of a continuous curve traced on a photographic film. This curve registers the maximum and minimum tensions and the average tension. The method can be applied to different arteries, permitting a precise study of the circulatory system of the normal and pathologic person. The essential part of the apparatus is a new type of manometric and optic oscillograph, which is linked to the needle puncturing the artery by a tube containing an anticoagulant. The amplification is considerable (about 20,000) because the displacements are extremely weak and the movements of the anticoagulating fluid through the lumen of the needle are nil, as are the effects of the viscosity, since the blood does not penetrate into the needle. The movements of the manometric oscillograph are photographed on a film moving at constant speed and marked every one twenty-fifth second by a chronograph; the arterial pressure (in centimeters of mercury) is thus marked on the film along longitudinal lines. Several tracings taken in normal persons and patients with various kinds of heart disease are reproduced, but the authors consider it too early to draw general conclusions. The curves of the arterial pressure make it possible not only to study the condition of the arterial system but also to discover modifications throwing light on the functional capacity of the myocardium.

Experimental Colibacillary Catatonia.—For several years, Baruk's attention has been drawn to the rôle of colibacillary infection in the genesis of certain psychoses. He has now succeeded in demonstrating experimentally the rôle of colibacillary toxin in the genesis of catatonia. By subcutaneous injections of a neurotropic colibacillary toxin (obtained from Vincent) he produced in animals all the signs of catatonia and even symptoms such as negativism and stereotypy. The experimental colibacillary catatonia is especially pronounced in animals with a highly organized nervous system, including cats and some other mammals, and much less perfect in birds. In other vertebrates one can no longer speak of catalepsy or catatonia but only of a torpid state. The fundamental mechanism of colibacillary catatonia appears to reside in a special somnolent action: the colibacillary toxin produces a torpor which, however, even in lower animals, is accompanied by special psychic reactions, such as agitation and emotional and aggressive reaction. These experimental ideas are in harmony with the important rôle of cataleptic sleep and oneirism in human catatonia. The author notes that the results were often inconstant, varying with the age and virulence of the toxin and resulting also from the difficulty of exact dosage of the toxin and of watching the animals continuously for hours or days to detect the sometimes transitory appearance of catatonic states.

41: 1601-1624 (Oct. 18) 1933

Tuberculous Contagion Among Nurses. E. Rist and Marie Simon.—p. 1601.
Composition of Cerebrospinal Fluid at Level of Occipital Foramen and of Iliac Crests. A. Barlovatz.—p. 1602.
*Mode of Action of Phrenicectomy. Bonafé.—p. 1604.

Mode of Action of Phrenicectomy.—Bonafé calls attention to the importance of distinguishing between the purely

mechanical action of phrenicectomy and the modification of the pulmonary innervation resulting from the unavoidable extirpation of fibers of the sympathetic during phrenicectomy. The rapid healing of severe ulcerating lesions after phrenicectomy is a result of vasomotor action due to the partial sympathectomy, in his opinion, and the congestive attacks, sometimes developing at the base of the lung, the asthmatic and the gastralgic attacks may be due to a vagosympathetic disturbance also resulting from the sympathectomy. A case observed by the author permits the dissociation of the mechanical effects of phrenicectomy and the accessory nervous effects. In a patient with fibrocaseous tuberculosis, the accidental exeresis of a cervical nerve other than the phrenic (by another surgeon) resulted in the rapid disappearance of the cough and auscultatory signs, although no modification of the movement of the diaphragm and no ascent had occurred. Exeresis of the intact phrenic nerve in a second intervention was followed by the customary immobilization and ascent of the hemidiaphragm. The absence of sensory and motor disturbances after the first intervention indicates that the extirpated nerve was an important anastomotic branch of the phrenic with the sympathetic. Probably an unusual anatomic condition permitted the dissociation of the mechanical effects of phrenicectomy and the purely nervous effects, heretofore considered accessory. Among the latter is the postoperatory dyspnea. It is usually out of proportion to the ascent of the diaphragm and the extent of the lesions; in this case it was observed after the first intervention. The complex mode of action of phrenicectomy that results from the more or less extensive obligatory sympathectomy demands further study.

Policlinico, Rome

40: 565-628 (Oct. 15) 1933. Surgical Section

Postoperative Peptic Ulcer. T. Blefari-Melazzi.—p. 565.
Hydronephrosis Due to Vascular Anomalies. C. Calef.—p. 575.
Influence of Parathyroids in Hematic Content of Some Electrolytes in Complete Derivation of Bile. G. Nicolosi.—p. 587.
*Periduodenal Hernias. U. Papa.—p. 607.
Amount of Lactic Acid in Blood in Experimental Occlusion of Common Bile Duct. M. Titone.—p. 618.

Periduodenal Hernias.—Papa states that 90 per cent of cases of internal hernia are periduodenal. Predisposing causes are abnormal size and depth of the fossas and narrowness of the outlet and abnormality in the position of the vascular arch that surrounds it, proximity of the inferior mesenteric vein to the fold circumscribing the opening, and minor resistance of the peritoneum or greater laxity of the retroperitoneal connective tissue in patients constantly losing weight. The author maintains that the periduodenal fossa forms a recess capable of accommodating an intestinal loop and comparable to the peritoneal vaginal pouch and its remains in oblique inguinal hernia. From this point of view all periduodenal hernias may be considered congenital, despite the intervention of acquired factors capable of gradually distending the small preexisting pouch and transforming it into a true hernial sac. According to most authors, this would be formed at the expense of the primary leaf at the right of the root of the mesentery, between the mesocolic vessels anteriorly and the fusion of the left leaf with the posterior parietal peritoneum. Therefore the anterior wall of the sac would be formed by two peritoneal layers, while posteriorly the peritoneum would cover the herniated viscera. It is certain that the denomination of retroperitoneal hernias is inexact. The contents of periduodenal hernias are almost always the small intestine and its mesentery. The author distinguishes three groups: in the first, the symptoms are those of ileus due to strangulation. Hernia may be suspected if there is evidence of an abdominal tumor in the right or left hypochondriac areas, if the sac develops within the transverse mesocolon and more especially if attacks of partial occlusion occur in which the ileus represents the final stage. The author observed that the hernia can be seen in the iliac fossa as it becomes larger. In the second group there are symptoms of gradually increasing intestinal obstruction accompanied by acute attacks of partial obstruction. The alterations in patency of the intestinal tract result in diarrhea, abdominal pains and colics and nausea accompanied by alimentary and biliary vomiting. Abdominal tumor, when present, may exhibit changes in size depending on intestinal function. Development of hemorrhoids and presence of blood in the feces are found in connection with circulatory disturbances of the lower mesenteric vessels. Diagnosis cannot be definitely made, but it can be helped by roentgenography. In the third group, objective examination reveals little or at most presents a diffuse abdominal distention. The patients suffer from dyspepsia, pains, a feeling of heaviness lasting several hours after eating, epigastric cramps, nausea, lack of appetite, belching and constipation. These symptoms might well be indicative of gastrectasia, dyspepsia and enteroptosis, as well as gastric and duodenal ulcer. In these cases roentgenologic examination may give an exact diagnosis. A characteristic of this entity, also found in a patient of the author, is the displacement of all the loops of the small intestine high up and to the left, leaving the right and lower quadrant void of barium shadows on roentgen examination. In the author's case the intestine displaced the large curvature of the stomach medially. Roentgenologic evidence suggestive of periduodenal hernia would be the presence of clear zones at definite distances apart above the small curvature and distinct from the gastric shadow.

Semana Médica, Buenos Aires

40: 869-972 (Sept. 28) 1933. Partial Index

*Significance of Deep S Wave in Lead I of Electrocardiogram. T. Padilla and P. Cossio.—p. 869.
*Treatment of Abortion. A. A. Puntel.—p. 879.
Congenital Diaphragmatic Hernias and Fissures. C. J. Duverges.—p. 913.
Roentgen Investigation of Prematurity by Ossification of Femur at Birth. C. M. Pintos.—p. 924.
Localization and Development of Melanic Cells in Human Cerebellum. J. Aranovich.—p. 927.
Abdominothoracocervical Deflection Caused by Noncancerous Pulmonary Disease: Case. H. Basabe.—p. 933.

Significance of Deep S Wave in Lead I.—On the basis of an examination of 8,000 electrocardiograms, Padilla and Cossio believe that the presence of a deep S wave in lead I of the electrocardiogram is of diagnostic value indicating organic diseases of the heart. They regard the S wave of the electrocardiogram as deep when its amplitude exceeds from 25 to 30 per cent the greatest amplitude of the initial ventricular complex in any of the three leads. A deep S wave deviated to the right side of the electrical axis indicates a preponderance of the right ventricle, caused usually by a disease of the mitral valve and to a lesser degree by a congenital heart disease or by a pathologic condition of the pulmonary artery. A deep S wave nondeviated to the right side of the electrical axis indicates in 95 per cent of the cases the presence of a myocardial disease, especially of the mitral valves, or pathologic changes in the coronary arteries, such as those observed in infarct of the myocardium and in angina pectoris. The coexistence of a deep S wave and of a deep Q wave is frequent because the two waves are the expressions of the same electrical phenomenon: a deep S wave represents the final phase of the QRS complex seen in lead I, while a deep Q wave represents the initial phase of the same complex as seen in lead III.

Treatment of Abortion.—Puntel reports the results of the management of abortion in a group of 2,219 patients who were treated in a gynecologic clinic during a period of ten years. In this group, 147 women were treated for either evitable or inevitable initial abortion. Pregnancy continued in 108; 4 had an incomplete abortion and 35 had a complete abortion. Forty-five women were admitted to the hospital after a complete abortion. These were dismissed after abstention treatment. A group of 2,360 women were admitted to the hospital after a noninfected incomplete abortion. The 2,110 patients in this group who were treated by curettage immediately after their entering the hospital were dismissed after a week's stay in the hospital. The progression of severe anemia caused by the intense hemorrhages in 407 patients in this group was controlled by checking the hemorrhages. A group of 324 patients were admitted with infected abortion without complications. This group is 10.8 per cent of the total number of abortions that were treated. In this group the 255 patients who were treated by curettage immediately after admission were dismissed in good condition sooner than those treated by the abstention treatment. A group of forty-three patients were admitted with infected abortion with complications; that is, with lesions of

the adnexa or of the parametrium. In this group, eighteen received emergency treatment with instrumental curettage. Only two of the eighteen patients survived the infection and their stay in the hospital was lengthened for several weeks. The rest of the patients in the group of forty-three with infected complicated abortion were treated by abstention and were dismissed in good condition sooner than those who survived among the group that had surgical intervention.

Beiträge zur klinischen Chirurgie, Berlin

158: 337-448 (Oct. 18) 1933

Experimental Studies on Immunobiology of Bone Marrow. K. H. Erb. —p. 337.
Cuprotect, a New Nonirritating, Odorless Antiseptic for Skin and Mucous Membranes. Von Linden, E. Herzberg and E. Guttmann.—p. 357.
Cheiloplastic Method of Lower Lip. V. Sanchís Perpiñá.—p. 367.
Diverticulum of Duodenojejunal Flexure. K. Horsch.—p. 381.
*Osmotherapy in Treatment of Brain Compression. A. Buchka.—p. 389.
Clinical and Experimental Studies on Bacterial Permeability of Intestinal Wall. E. Seifert.—p. 400.
Atypical Obliquely Contracted Pelvis with Protruding Acetabula. W. Jaroschy.—p. 412.
Radiation of Malignant Tumors Before and After Operation. H. Rahm. —p. 430.

Osmotherapy in Treatment of Brain Compression.—Buchka states that the dehydration method of treatment of increased intracranial pressure, introduced by Weed and McKibben and widely adopted in the United States, was not applied in Germany until recently. The purely mechanical explanation of the relation of brain compression to increased blood pressure has given way to the modern theory of irritation of the vasomotor centers as the cause. The author has used the dehydration method in Schmieden's clinic for the last three years in instances of injury to the skull and as a preoperative and postoperative measure in tumors of the brain. This paper is concerned with the results obtained in thirty-six cases of injury to the skull, in nineteen of which a fracture of the skull was present. The author has come to discard sodium chloride or magnesium sulphate because of unpleasant by-effects. Since 1931 he has used, exclusively, a 50 per cent solution of dextrose intravenously in doses ranging from 50 to 200 cc. The injection is given slowly, occupying from ten to twelve minutes. No untoward effect, such as rapid fall in the blood pressure, was noted. When rising intracranial pressure is due to a depressed fracture or to a subdural hematoma, the only rational treatment is the lifting of the depressed fracture or the ligation of the spurting vessel. Osmotherapy is indicated in cases in which the local symptoms are largely absent and the general symptoms predominate. Of the thirty-six patients treated by osmotherapy, seventeen were symptom free at the end of the treatment and eleven had only slight symptoms. Two died shortly after injury of severe complications, and in six the end-result could not be estimated because of such conditions as epilepsy or psychosis. Histories of four patients are given in whom intravenous injections of dextrose promptly relieved symptoms persisting from two to three weeks after the injury. The author expresses the belief that in cases with difficult localization and predominant general symptoms the method of osmotherapy will replace that of the operation of subtemporal decompression.

Dermatologische Wochenschrift, Leipzig

97: 1467-1494 (Oct. 14) 1933

Multiple Tumor-Like Skin Nodules of Unknown Origin. P. Frank. —p. 1467.
*"Fever Therapy" of Female Gonorrhea: Experiences in 163 Cases. H. Feilchenfeld.—p. 1471.

Fever Therapy of Female Gonorrhea.—Feilchenfeld employed fever therapy in 163 women with gonorrhea. A bacteriogenic protein preparation was injected intravenously. The aim was to produce a fever of about 40 C. (104 F.). The total number of injections was from five to six. In patients who, in the course of these injections, reacted with fever of less than 38.9 C. (102 F.), the therapeutic result was doubtful, unless they still reacted after the fifth or sixth attack. In some cases favorable effects were produced after the first injection. The author advises against a too large number of injections. He generally began with the injection of 0.1 cc. and increased the dose by 0.1 cc. each time until 0.6 cc. had been reached. Intervals of from four to five days between injections were found most advantageous, since a too rapid succession of injections (intervals of one or two days) may accustom the organism so that the febrile reaction is no longer sufficiently intense. Of the total number of 163 patients, 117 (71.7 per cent) improved and became free from gonococci as the result of the fever therapy. The treatment was effective particularly in refractory gonorrhea of the cervix, and it counteracted inflammatory disturbances of the adnexa. However, open gonorrhea of the mucous membrane of the urethra and of the anus and gonorrhea of the vulvovaginal glands was not influenced by the fever therapy. The author thinks that the therapeutic effect is due primarily to some alteration of the tissues. He thinks that fever therapy is most effective in gonorrhea of the cervix which does not yield to local measures. But since severe complications cannot always be avoided in the course of fever therapy, he advises that it be used only as a last resort.

Deutsche medizinische Wochenschrift, Leipzig

59: 1625-1658 (Oct. 27) 1933

Innervation of Blood Vessels. P. Stöhr, Jr.—p. 1625.
*Electrocardiographic Observations in Acute Myocarditis. H. Quincke. —p. 1629.
Heart Disease and Pregnancy. W. Schultz.—p. 1632.
Studies on Human Venous System: Severe Varicosis in Young Person. O. Diehl.—p. 1635.
Velocity of Circulation. P. Bielschowsky and K. Lange.—p. 1637.
Angina Pectoris. D. D. Pletnew.—p. 1639.
Traumatic Endocarditis: Case. P. Siebert.—p. 1643.
Critical Evaluation of Methods Employed in Counting of Thrombocytes. K. Baedorf.—p. 1643.
Mitral Stenosis Following Successive Intoxications with Chlorine Gas. H. Pernice.—p. 1644.
Arhythmia or Arrhythmia? Bastanier.—p. 1646.
New Enforcement Regulations on Food Law. W. Pfannenstiel.—p. 1647.

Electrocardiographic Observations in Acute Myocarditis.—Quincke combines the description of the course of a myocarditis with a description of the most frequent disturbances in the conduction system of the heart. He shows how the electrocardiographic record of a new myocardial lesion gives a clear insight into the steadily changing disturbances of the cardiac function. In the course of a myocarditis lasting two weeks, all forms of conduction disturbances may appear and disappear again: constant and increasing retardation of the conduction, partial auriculoventricular block, bundle branch block and arborization block.

Klinische Wochenschrift, Berlin

12: 1593-1632 (Oct. 14) 1933

Neuropathologic Research on Ataxia. P. Vogel.—p. 1593.
Constitutional Anatomic Studies on Development of Various Organs in Rabbits. J. A. Hammar.—p. 1597.
Melanophore Hormone of Hypophysis and Eye. A. Jores.—p. 1599.
*Iodine Combining Capacity of Blood Under Normal and Pathologic Conditions. K. Hinsberg and G. Holland.—p. 1601.
Studies on Pulmonary Circulation: Regional Peculiarities of Blood Perfusion Under Normal and Pathologic Conditions. E. K. Wolff and R. Klopstock.—p. 1602.
Physiology of Seminal Vesicles. H. Knaus.—p. 1606.
Differentiation Between Whooping Cough and Influenza Bacilli. M. Kasahara.—p. 1609.
*Experimental Investigations on Action of Milk Injections in Gonococcic Infections. A. Buschke and W. Casper.—p. 1611.
Chronic Intermittent Gastric Volvulus. L. von Friedrich.—p. 1613.
Production of Histamine by Irradiation of Histidine Solution. P. Holtz. —p. 1613.
Relations Between Thyrotropic Substance of Anterior Hypophysis and Suprarenals. A. Loeser.—p. 1614.
Hormone of Suprarenal Cortex and Circulation. G. Norlin and C. R. Skoglund.—p. 1614.
Acute Cardiac Pulmonary Edema and Its Relation to Pressoreceptors. S. Wassermann.—p. 1615.
Histologic Observation in Skeletal Diseases (Osteitis Deformans, Osteitis Fibrosa). L. Michaëlis.—p. 1619.

Iodine Combining Capacity of Blood.—Hinsberg and Holland call attention to the important rôle of the unsaturated fatty acids in intermediate metabolism, in the processes of food resorption, and in the regulation of the cellular function, particularly of diffusion. The unsaturated fatty acids detected so far in the organism are oleic, linoleic, linolenic, arachidic and clupanodonic acids. In order to avoid complications, the

authors determined only the total amount of unsaturated fatty acid. For the extraction they employed Bloor's method, and the bromine additive capacity was determined according to Winkler, but, instead of the iodine number of the extracted fat, they determined the iodine combining capacity; that is, the quantity of iodine bound by the fatty acids from 100 cc. of blood. This quantity is more constant than the iodine number, because it is independent of the total quantity of the lipoids. In the formation of the unsaturated fatty acids the functions of the liver, kidney, intestine, biliary tract, pancreas and thyroid are involved. The authors cite experiments demonstrating that a slight lack of oxygen produces an increase in the unsaturated fatty acids of the blood, while great deficiency of oxygen effects a reduction. The important part played by unsaturated fatty acids in intermediate metabolism is borne out by experiments on pancreatectomized dogs which survived for more than two years without insulin, when lecithin (containing unsaturated fatty acids) was added to their food. This effect could not be produced with saturated fatty acids. The authors determined the quantities of the unsaturated fatty acids in healthy persons and in patients suffering from various disorders. As a rule the iodine combining capacity was increased noticeably in diseases of the liver. Patients having pernicious anemia likewise showed values greater than normal, but a gradual and steady reduction set in under the influence of liver therapy, while discontinuation of the liver therapy again was followed by an increase. The hyperglycemia of diabetic patients could be considerably reduced by lecithin (prepared from egg yolks), and the lecithin was the more effective, the higher its iodine combining capacity.

Action of Milk Injections in Gonococcic Infections.—The therapeutic efficacy of milk injections in gonorrhea and particularly in the metastatic eye disorders induced Buschke and Casper to study the action mechanism of milk injections in animal experiments. Studies on white rats disclosed that prophylactic intraperitoneal injections of milk protect the majority of the animals against a gonococcic infection induced with ten times the lethal dose. This could perhaps be interpreted as indicating an active immunity conferred on the animals by the milk injections. However, the authors point out that milk therapy has no influence on urethral gonorrhea, while it is highly effective in gonorrheal conjunctivitis, and that specific gonococcus vaccines do not influence the metastatic eye diseases of gonorrhea. Thus the action of milk cannot be considered due to the production of a specific immunity. The authors assume that the gonococcus produces certain toxins and that the milk checks the formation of toxin in the organism. By influencing the reticulo-endothelial system, it stimulates the leukocytes to phagocytosis and to the formation of protective substances.

Medizinische Klinik, Berlin

29: 1395-1430 (Oct. 13) 1933

Strabismus. W. Meisner.—p. 1395.
*Treatment of Sterility. W. Benthin.—p. 1397.
Results of Treatment of Funicular Myelitis in Pernicious Anemia. H. Schlichting.—p. 1401.
*Clinical Significance of Autocomplement Titer: Contribution to Allergy Problem. F. Deutsch and E. Weiss.—p. 1402.
Contusion Rosette of Lens, Its Pathogenesis and Its Significance for Expert Testimony in Accidents. K. W. Ascher.—p. 1405.
Phlyctena, Erythema Nodosum and Poncet's Rheumatism. W. Neumann. —p. 1407.
Pulsating Bronchostenosis of Left Side as Sign of Aneurysm of Aorta. D. Sučić.—p. 1408.
Coagulation Band of Weltmann in Tuberculosis. D. Roháčová and E. Weichherz.—p. 1410.
*Ménière's Vertigo in Polycythemia. K. Bieling.—p. 1410.
Goethe's Theory of Metamorphosis, Its Meaning and Significance in Present-Day Biology. H. André.—p. 1411.
Surgical Treatment of Injuries of Hand and Fingers (with Exception of Bone Fractures). H. Schmorell.—p. 1414.

Treatment of Sterility.—Benthin maintains that the man is at fault in more than a third of sterile marriages and that this aspect of sterility should be thoroughly investigated before the treatment of the woman is begun. Sterility may exist in case of apparently normal genitalia, because functional disturbances of the ovaries, of the incretory organs or of extragenital organs and constitutional, psychic, nervous, climatic and nutritional influences may eventually cause sterility. Moreover, the manner in which the sexual act is performed may be at fault. The absence of orgasm and of sexual feeling represent important factors. Vaginismus, due to spasticity of the musculature of the pelvic floor, the result of fear, generally can be counteracted by proper explanations. The woman should be told that the vagina can be opened by abdominal muscular pressure. The author describes measures for the prevention of too rapid discharge of the semen from the vagina, such as a prolonged rest and a slight elevation of the pelvis following coitus. He discusses the advisability of dilatation of the cervical canal, insufflation of the uterine tubes, improvement of the woman's general condition, temporary sexual abstinence, treatment with ovarian preparations and artificial impregnation. Myomas of the uterus are less frequently a cause of sterility than is sometimes believed. Their removal is necessary only in case they are of submucous and cervical location, in case they grow rapidly and are multiple, and when they cause distortion of the uterine cavity.

Autocomplement Titer and Allergy.—Deutsch and Weiss point out that new serologic methods have stimulated interest in the determination of the normal antibody content of the serum and particularly of the autocomplement titer, but that the nature of the complement is not yet completely understood, for by some it is considered a structural constituent of the serum, by some a protein body and by others a ferment, while at present it is generally considered a functional condition of the serum rather than a distinct body. At any rate, it is certain that the complement in the serum is a normal biologic condition, and the disappearance of the complement in anaphylaxis and the changes it undergoes in various conditions are therefore of great interest. The authors emphasize that the height of the complement titer is largely dependent on the method by which it is determined; for instance, it is important how much time has elapsed since the withdrawal of the blood, in what manner it was stored in the meantime, and at what temperature the test is made. They made their tests four hours after the withdrawal of the serum. The titer is expressed by the quantity of serum that effects complete lysis. Titer values of less than 0.05 cc. indicate an increase in the complement, and values in excess of 0.08 cc. indicate a reduction in the complement. Inhibition of lysis when 0.2 cc. or more of serum is added indicates practically a complete absence of the complement. The authors call attention to reports in the literature, in which the theory is defended that certain forms of rheumatism are not infections but present an allergic condition, which in turn is due to a sensibilization originating in a focus of infection. In the allergic complex, conditions such as polyarthritis, endocarditis and glomerular nephritis present a phase that is accompanied by a disappearance of the complement. There are a number of diseases of varying etiology in which allergic reactions exist, but only if the definition of allergy is taken in the wider sense as given by von Bergmann does it become understandable that a disappearance of the complement exists in such different disorders as atrophy of the liver and allergy, for in both of these processes the protein metabolism is seriously impaired. The authors illustrate the significance of the disappearance of the complement with a case history. Von Bergmann's definition of allergic disorders stresses the significance of endogenic allergens. This author thinks that the intermediate autointoxication of the sensibilized organism presents an important factor in the problem as to why inflammations flare up and subside, whether bacteria play a part in them or not. Observations on the phenomenon of the autocomplement indicate how the knowledge of an allergic inflammation can be utilized in the clinic.

Ménière's Vertigo in Polycythemia.—A report in the recent literature about the concurrence of Ménière's vertigo with polycythemia and the disappearance of Ménière's vertigo following the successful treatment of the polycythemia with a high fat diet induces Bieling to report a case of his own observation. The patient, a man aged 38, had frequent attacks of vertigo and complained of ringing in the ears. Examination of the blood revealed an erythrocyte count of over six million, a hemoglobin content of 107 and a color index of 0.85. Treatment with a preparation of spleen was instituted in order to counteract the polycythemia. The result of this treatment was that the blood picture became normal and the Ménière vertigo disappeared.

Münchener medizinische Wochenschrift, Munich

80: 1577-1612 (Oct. 13) 1933

Surgical Treatment of Gastric and Duodenal Ulcers. H. von Haberer. —p. 1577.
Remarks on Diagnosis and Treatment of Polyarthritis and on Infectious Processes of Joints. J. Neideck.—p. 1580.
*Intrathoracic and Intra-Abdominal Quartz Lamp Irradiation. C. Fervers.—p. 1585.
Hay Fever and Action of Yeast. W. Vaubel.—p. 1586.
Neurologic Remarks on Relations of Body to Psychic Processes. L. R. Müller.—p. 1587.
Fractures of Ribs. H. Doerfler.—p. 1591.
Simple Method for Prevention of Nasal Catarrhs and of Influenza. A. von Halász.—p. 1593.
Alleviation of Pain in Inflammatory Diseases of Urogenital Tract with Leukotropin. H. Laepple.—p. 1593.
Determinability of Blood Groups on Fresh Blood in Capillaries. A. Ponsold.—p. 1594.
Insulin Allergy and Its Influence on Diabetic Metabolism. H. Nonn. —p. 1597.

Intrathoracic and Intra-Abdominal Quartz Lamp Irradiation.—Fervers calls attention to the fact that in recent years efforts have been made to apply ultraviolet rays to parts of the body ordinarily not reached by rays: the larynx, the vagina and even the inside of the bladder. The peritoneum has been irradiated with ultraviolet rays in the course of operations. The author devised a new method comparable to this irradiation during a surgical intervention. By puncture, the abdominal and pleural cavities can be subjected to the therapeutic action of ultraviolet rays. The instrumentarium consists of a rod-shaped cold quartz lamp. The shaft of the lamp is silver plated and only 5 cm. at the end is left uncovered, so that the rays are emitted only here. The rays are produced by a glowing discharge in the burner, and a transformer keeps the burner cold in the open as well as in the body cavities, so that the temperature of the body is not surpassed. For special purposes the linear burner may be surrounded by a tightly fitting cover of blue or dark ultraviolet glass. The lamp can be connected with any lighting circuit. The intrathoracic and intra-abdominal treatments require pneumothorax and pneumoperitoneum, respectively. The irradiation generally lasts three minutes, after which the small opening is closed with a cutaneous suture or with a clamp.

Sovetskaya Khirurgiya, Moscow

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Stones in the Liver. I. G. Rufanov.—p. 623.
*Errors in Diagnosis of Sarcoma of Extremities and of Body. P. Ya. Ilchenko.—p. 630.
Treatment of Fractures of Patella. B. Rozov.—p. 652.
Healing of Postoperative Wound as Influenced by Method of Anesthesia and Suture Material. L. M. Nisnevich and I. M. Segal.—p. 663.
Treatment of Panaritium of Palm According to Method of Clapp. P. M. Maksimov-Popov and V. I. Orlov.—p. 669.
Results of Radical Operation of Femoral Hernia After Method of P. A. Gertsen. M. G. Lomazov.—p. 676.

Errors in Diagnosis of Sarcoma.—Ilchenko states that there were 187 cases of sarcoma of the extremities and of the trunk treated between 1921 and 1931 at the Institute for the Treatment of Tumors in Moscow. In 71 of these a wrong diagnosis was made: 66 were diagnosed incorrectly at various medical institutions prior to admission to the institute, 4 were diagnosed incorrectly at the institute but were recognized later, and one received a wrong diagnosis at the institute. The most frequent diagnostic errors included such conditions as sciatica, periostitis, tuberculosis, osteomyelitis, syphilis and the various benign tumors. The hip and the leg furnished the greatest number of wrong diagnoses. The first symptom of sarcoma in 50 per cent of wrong diagnoses was pain, in 31 per cent the tumor, and in 6 per cent, in addition to other early symptoms, elevation of temperature. The following factors contributed to the mistakes in the differential diagnosis: (1) the presence of early symptoms of sarcoma, such as pain and rise in temperature, in a number of conditions of nonblastomatous character; (2) inherent faults in such diagnostic means as roentgen examination or biopsy, or their employment at the wrong moment; (3) diagnosis made on the basis of a single method of investigation, such as roentgen examination or biopsy, without a consideration of the general clinical picture, and (4) deep localization of the growth. The author suggests that the diagnosis of sarcoma should be thought of in the presence of long continued pain in an extremity not yielding to treatment, even in the absence of a clinically demonstrable tumor. In his material 80 per cent of sarcomas were mistaken for inflammatory lesions, while in 20 per cent the error was in the reverse order, the inflammatory lesions being diagnosed as sarcoma. Because of similarity in the early symptoms of inflammatory lesions and of sarcoma, physical therapeutic measures, particularly massage, should be employed with great caution. In the presence of a tumor the nature of which has not been determined, such therapy is inadvisable.

Finska Läkaresällskapets Handlingar, Helsingfors

75: 829-929 (Sept.) 1933

*Hepatogenic Hemorrhagic Diathesis. E. A. von Willebrand.—p. 829.
Remarks on Wahlfor's Investigations on Pathogenesis of Choked Disk. O. Heinonen.—p. 847.
Gonococcic Sepsis in the New-Born: Cases. B. Söderling and S. Tenlén.—p. 856.
Electrical Double Layer of Skin and Excitation Wave in Peripheral Nerves. F. Leiri.—p. 863.
*Organic Heart Diseases in Thrombo-Angiitis Obliterans and in Raynaud's Syndrome. M. C. Ehrström.—p. 892.

Hepatogenic Hemorrhagic Diathesis.—Von Willebrand states that his first two cases present a picture in accord with Frank's "hypoleukia splenicohepatica," a syndrome occasionally seen in connection with grave liver insufficiency. He ascribes the origin of the hemorrhages mainly to the pronounced thrombopenia and partly to changes in the blood vessels. In the third case, with seropositive syphilis and aortitis, arsphenamine jaundice and acute atrophy of the liver developed after treatment with neoarsphenamine. The patient had massive hemorrhages with marked jaundice, prolonged bleeding time and delayed retraction of the clot. The pathogenesis of the hemorrhages is chiefly attributed to the disturbance in coagulation, also in part to changes in the blood vessels.

Organic Heart Diseases in Thrombo-Angiitis Obliterans.—Ehrström describes four cases with organic defect in the mitral valve, one combined with thrombo-angiitis obliterans, one with vasomotor neurosis, and two with vasomotor neurosis and organic change in the blood vessels. He asserts that changes in the blood vessels in Raynaud's disease and thromboangiitis obliterans and in septic and some forms of syphilitic angiitis may occasionally present similar anatomopathologic pictures. With combined vasomotor symptoms and organic changes in the blood vessels it is extremely difficult to determine which is primary. The combination of organic heart defects, especially mitral defects, with changes in the peripheral vessels makes it probable that the latter occurred secondarily on the basis of pathologic changes of the circulation due to the cardiac defect.

Ugeskrift for Læger, Copenhagen

95: 1095-1114 (Oct. 5) 1933

*Mummification of Skin (Decubitus). P. Freudenthal.—p. 1095.

Mummification of Skin.—Freudenthal reports two cases of skin gangrene resembling necrosis due to pressure (decubitus), one on the radial side of the arm and the other on the volar surface of the underarm. Both are ascribed to a tightening bandage, properly applied but allowed by the patient to remain without attention for several days and transformed by blood or secretion into a firm, hard, dry compress which compromised the nutrition of the skin.

95: 1115-1138 (Oct. 12) 1933

Malignant Case of Lupus Vulgaris Treated with Modified Forms of Arc Light. S. Lomholt.—p. 1115.
*Hereditary Multiple Exostoses. O. Andersen.—p. 1116.

Hereditary Multiple Exostoses.—The exostoses in the first case described by Andersen were discovered when the patient, now a man of 25, was 4 years old. In the second case in a girl, aged 8, signs of exostoses were noted at the age of 3. The author, like others, suggests the theory that endocrine disorders play a part in the origin of exostoses. Both patients were fat until the age of 2 and have since been thin and unable to gain. About the time of puberty in the first instance some exostoses disappeared and the others stopped growing. Of thirty-seven members in four generations of the family of the second patient, nine have multiple exostoses. Inheritance is thought to depend on a single dominant factor.